Implementing the ISO 14001 Environmental Management System Specification, Version 2.0

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Table of Contents

I. Introduction 4
Background 4
ISO 14001, The Environmental Management System Specification 4
II. Getting Started 6
Note on this Implementation Handbook 6
Preliminary Considerations 7
Implementation Approaches 12
Implementation Plan 14
Getting Started Worksheet 15
III. Core Elements – Environmental Policy, Environmental Aspects, Objectives and Targets, Environmental Management Programs, Internal Audit, Management Review, and Integration with other Management Systems 18
1. The Environmental Policy (ISO 14001:2004, §4.2) 18
Environmental Policy Worksheet 24
2. Environmental Aspects (ISO 14001:2004, §4.3.1) 27
Environmental Aspects Worksheet 36
3. Objectives, Targets, and Programs (ISO 14001:2004, §4.3.3) 38
Environmental Objectives, Targets, and Management Programs Worksheet 41
4. Internal Audits (ISO 14001:2004, §4.5.5) 49
5. Management Review (ISO 14001:2004, §4.6) 50
6. Integration with other Management Systems 51
IV. Elements of ISO 14001 Triggered by the Significant Environmental Aspects 53
1. Competence, Training, and Awareness (ISO 14001:2004, §4.4.2) 53
Significant Aspects Training Worksheet 58
2. Operational Control (ISO 14001:2004, §4.4.6) 59
3. Monitoring and Measurement (ISO 14001:2004, §4.5.1) 61
Worksheet Example on Operational Controls and Monitoring and Measurement 63
V. Key Elements of ISO 14001 65
1. Resources, Roles, Responsibility, and Authority (ISO 14001:2004, §4.4.1) 65
2. Legal and Other Requirements (ISO 14001:2004, §4.3.2) 70
3. Evaluation of Compliance (ISO 14001:2004, §4.5.2) 73
4. Nonconformity, Corrective and Preventive Action (ISO 14001:2004, §4.5.3) 73
Resources, Roles, Responsibilities, and Authorities Worksheet 75
Table of Applicable Legal and Other Requirements 76
VI. Communication, Emergency Preparedness, Documentation, Control of Documents, and Control of Records under ISO 14001 77
1. Communication (ISO 14001:2004, §4.4.3) 77
Communications Worksheet 80
2. Emergency Preparedness and Response (ISO 14001:2004, §4.4.7) 81
Immediate Response Directions – Fire/Explosion 83
Emergency Preparedness and Response Worksheet 86
4. Documentation (ISO 14001:2004, §4.4.4) 87

5. Control of Documents (ISO 14001:2004, §4.4.5) 91
6. Control of Records (ISO 14001:2004, §4.5.4) 91
Documentation, Document Control, and Record Keeping Worksheet 93
VII. ISO 14001 Auditing and Registration..... 96
VIII. The Future of ISO 14001 988

Implementing the ISO 14001 Environmental Management System Specification

I. Introduction

Background

Environmental management began in earnest around 1970 as a direct result of environmental catastrophes and governmental reaction to those catastrophes. In many countries, environmental regulations that focus on control of environmentally damaging emissions to air, discharges to water, and disposal of hazardous wastes were instituted in an effort to prevent future environmental catastrophes and to limit toxic releases to the environment. Regulations, however, too often had the effect of placing a ceiling on environmental performance. Many industrial organizations, reacting negatively to governmental environmental regulations that they view as being based on bad science, adding unnecessary costs, or making them uncompetitive in international markets, have restricted their environmental management efforts to complying with regulations and nothing more.

"Organization"

Throughout this document the term "organization" is used where the reader might be more accustomed to seeing "corporation" or "company". This term is in keeping with ISO 14001 which recognizes that adverse environmental impacts are not limited to industrial corporations and that an all-encompassing term is organization, which is specifically defined in ISO 14001 as a "*company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration*.

In response, global institutions, recognizing the interconnected problems of persistent environmental degradation, growing economic divisions, and associated poverty and hunger, developed programs to begin to bring economic and social goals into balance with ecological and natural resource preservation. In 1992, the Global Environmental Summit, convened in Rio de Janeiro by the United Nations, brought representatives of 178 nations together to endorse *Agenda 21: The Program of Action for Sustainable Development. Agenda 21* details the actions that are necessary on the part of organizations of all kinds if sustainability is to be achieved and collapse of economic, environmental, and social systems is to be avoided.

A second global summit, the World Summit on Sustainable Development (WSSD), was held in Johannesburg in Summer 2002. In tabulating the results since the Rio summit, the WSSD determined that all environmental trends had experienced further degradation and that the only sustainability gains to be reported were progress against infectious diseases, the global literacy rate, and the greater inclusion of women in society's activities. The significance of Rio is that it marks the time when much of the world realized that we cannot continue on the same path we have been on. The significance of Johannesburg is the realization that, in spite of enormous effort on the part of many institutions, humankind is losing the battle for sustainability.

ISO 14001, The Environmental Management System Specification

Immediately following Rio, other institutions began focusing on the development of Environmental Management Systems (EMSs) that encourage comprehensive *identification* of an organization's adverse environmental aspects followed by *management* of those aspects having environmental significance.

ISO 14001 is the EMS Specification developed by the International Organization for Standardization (ISO) of Geneva, Switzerland as a part of the ISO 14000 series of environmental management documents. It was issued as both an International and American National Standard in September 1996. The Second Edition of ISO 14001, ISO 14001:2004, was issued as an International Standard on November 15, 2004 and subsequently as an American National Standard.

"Environmental Aspect"
ISO 14001 defines an Environmental Aspect as an "element of an organization's activities or products or services that can interact with the environment."

ISO 14001 establishes a framework for the conduct of environmental management by requiring the organization to define an Environmental Policy and establish sixteen management procedures that support the policy. Many of the ISO 14001 procedures already exist in some form within organizations and only require modification to meet the requirements of ISO 14001. Other procedures have to be added in their entirety. All of the ISO 14001 procedures represent best management practices as defined by a consensus of the representatives of more than 50 national standards bodies and Non-Governmental Organizations (NGOs) who participated in the development of ISO 14001:1996 from early 1993 through July 1, 1995 and in the development of the Second Edition from early 2002 until mid-2004.

"ISO 14000"
There is often confusion over the use of the term ISO 14000 because many people say ISO 14000 when they mean ISO 14001. ISO 14000 refers to the series of voluntary standards and guidelines for environmental management developed by subcommittees of ISO Technical Committee 207 (TC 207); ISO 14001 is one of those standards. Ultimately, TC 207 may develop 15 - 20 environmental management documents in the ISO 14000 series.

ISO 14001 Registrations
As of April 2005, 88,800 organizations worldwide had implemented and registered, through third-party audits, their conformance to ISO 14001's requirements. The U.S. was sixth in number of registrations, with 4,671, behind Japan (18,104), China (8,865), Spain (6,523), the UK (6,223), and Italy (5,304).

Source: http://www.ecology.or.jp/isoworld/english/analy14k.htm, viewed August 5, 2005.

II. Getting Started

This section addresses questions about launching ISO 14001 within the organization. After a brief description of this Handbook and its contents, this section is divided into two subsections – Preliminary Steps and Implementation Approaches. Three points are emphasized: 1) the importance to successful ISO 14001 implementation of top management involvement, 2) taking advantage of existing organizational procedures that are established and familiar, and 3) avoiding getting bogged down in the *process* of implementation to the detriment of results.

Note on this Implementation Handbook

ISO 14001 establishes a set of requirements for an environmental management system but does not describe how these requirements are to be implemented. This guide to implementing ISO 14001 is based on personal experience with implementation projects and accumulated data on 45 ISO 14001 implementations – 31 manufacturers, 11 municipal organizations, 2 state agencies, and 1 headquarters organization. It describes how these organizations have implemented the requirements of ISO 14001.

How They Fared

The 45 organizations in the database achieved different levels of completion with their EMS projects:

- 6 abandoned the EMS before the project was complete;
- 8 did not implement all of the elements of ISO 14001 but did implement enough to establish a functioning EMS;
- 21 implemented all of the elements of ISO 14001 to a registration-ready level but did not register; and
- 10 completed their implementation and went on to register.

Some descriptions of how to implement ISO 14001 misstate the requirements of ISO 14001 by drawing on external sources – usually Annex A of ISO 14001 or ISO 14004 – to interpret the requirements. It is important for implementers to recognize that ISO 14001's requirements are stated in ISO 14001, §4, *only* and supported by the definitions in §3. *No other document is authoritative on the requirements of ISO 14001*. This Handbook, therefore, draws only on ISO 14001 §§3 and 4, Terms and Definitions and Environmental Management System Requirements, respectively, for authority and on actual experience in implementing ISO 14001. Where interpretations of ISO 14001 not based on §§3 and 4 are made, they are so identified.[1]

[1] **Caveat –** The ISO 14001 Specification contains the objectively auditable requirements for ISO 14001. It is important that users understand 1) that the requirements of ISO 14001 are stated in §4, only; 2) that terms having special meaning under ISO 14001 are defined in §3; and 3) that there are no other references that officially interpret, change, add to, or subtract from the requirements of ISO 14001 as stated in §4 or the terms defined in §3. The following quotations support this statement:

ISO 14001:2004, §2, Normative references: "No normative references are cited."

ISO 14001:2004, §3, Terms and Definitions: "For the purposes of this International Standard, the following terms and definitions apply."

ISO 14001:2004, Annex A, §A.1:

> "The additional text given in this annex is strictly informative and is intended to prevent misinterpretation of the requirements contained in Clause 4 of this International standard. While this information addresses and is consistent with the requirements of Clause 4, it is not intended to add to, subtract from, or in any way modify these requirements."

Finally, this Handbook is to be used with ISO 14001:2004; a copy of ISO 14001:2004 should always be available for reference when the Handbook is used.

Preliminary Considerations

A number of factors should be considered by organizations contemplating adoption of ISO 14001, including:

Drivers for Implementation – Organizations are driven to undertake change, including implementation of an EMS, for four principal reasons:

1. Public Policy – Governments drive change by organizations through laws, regulations, economic instruments, and enforcement mechanisms.

2. Customer Requirements – If a customer requires its supplier to change, the supplier either does what the customer wants or loses the customer.

3. Moral Persuasion – Organizations, such as environmental non-governmental organizations (NGOs), are created for the express purpose of bringing about change within other organizations by compelling their attention to social and environmental issues.

4. CEO Values – CEOs often assert their personal values on the organization, compelling it to change.

When one or more of these drivers are present, the organization is much more likely to accomplish change than when they are not. A good starting point for the implementation of ISO 14001 is the determination if any of these drivers are present.

Potential Effects of the EMS – Implementing ISO 14001 has a pervasive effect on organizations, causing them to consider the potential environmental aspects of all of their activities, products, and services. The good news is that in becoming more environmentally aware, organizations often identify ways that they can save energy and materials, thus reducing both costs and adverse environmental impacts.

ISO 14004:2004, *Environmental management systems – General guidelines on principles, systems and supporting techniques*, also, is not intended to be a guide to implementing ISO 14001. ISO 14004, §1, Scope:

> "While the guidelines in this International Standard are consistent with the ISO 14001 environmental management system model, they are not intended to provide interpretations of the requirements of ISO 14001."

There is provision for a formal process to issue clarifications of intent on ISO 14001 for the periods between issuance of a standard and its subsequent revision. Existing clarifications of intent are available from the American Society for Quality on its website, http://standardsgroup.asq.org.

In addition, many organizations realize gains in other areas as well. The systematic method for identifying environmental aspects and determining which are significant, for example, applies equally well to identification and management of health, safety, and operational risk exposures. Indeed, many organizations convert ISO 14001 to an environmental, health, and safety standard with the addition of the words 'health' and 'safety' at appropriate places within their ISO 14001 Procedures Manuals.

Other organizations discover through the ISO 14001 implementation process and through registration audits that certain business functions that they thought were being properly carried out, in fact, are not.

None of these benefits from ISO 14001, however, are specifically discoverable beforehand. The only way to know what the collateral benefits of ISO 14001 implementation are is to do the actual implementation.

Collateral Benefits

Following are some of the actual collateral benefits to ISO 14001 implementation realized by organizations in the database:

- Identification of gaps in emergency and accident response preparedness;
- Recognized logic of considering external benefits and costs avoided when making cost/benefit analyses and decisions;
- Upgraded Process Safety Management programs when it was determined that the process being managed was also a significant environmental aspect;
- Recognized the existence of a high heart attack risk exposure due to aging, mostly male workforce;
- Recognized need for a Safety Manager;
- Need to have an emergency response plan that contemplates egress for handicapped personnel;
- Recognition of a fire risk exposure that threatened the entire facility and could be easily eliminated;
- Enhanced working relationships with suppliers by convening a meeting with over 50 suppliers to jointly study the issue of excess packaging;
- Gained leverage in negotiating a consent agreement with a state environmental agency;
- Turned environmental commitments into a marketing plus;
- Energy savings;
- Working together as an organization, not as separate locations;
- Recognition that some internal functions were dysfunctional and that personnel had to be replaced;
- Recognition of an occupational health exposure that outweighed all of the environmental aspects;
- Compelled to complete an Emergency Response Plan that had been languishing for 18 months; and
- Drew necessary attention to inadequately managed environmental legal requirements.

Human and Financial Resource Commitment – When considering implementation of an EMS, management wants to know what the costs are going to be. For many organizations, implementing ISO 14001 is, first, a process of implementing the EMS procedures while establishing objectives and targets that emphasize behavioral change, the low-hanging fruit of environmental performance. The initial implementation cycles, in general, do not result in heavy capital investments.

Initial Capital Outlays

Of the 45 organizations in the database, only 7 made capital expenditures as a direct result of implementing ISO 14001 for the first time. One organization, by far the exception, determined to spend $350,000 on a waste recovery process that would cost-effectively recover up to a million pounds of material for reuse per year.

Organizations should not conclude, however, that there are no costs associated with implementing ISO 14001. The typical organization will spend 300 hours of staff time with the

initial implementation of ISO 14001 and may incur consulting costs as well. And there is no guarantee that efficiencies discovered as a result of ISO 14001 will offset the costs of implementation. When considering the costs of implementation, organizations should consider the value of introducing a systems approach to environmental management, the spillover benefits of that for other management disciplines, and how much staff time and consulting fees will be required to implement ISO 14001.

Average Implementation Time
The 45 organizations in the database, having an average of 540 employees, required an average of 317 hours to implement ISO 14001.

Initial Implementation – When first implementing ISO 14001, organizations should keep in mind that they are undertaking three tasks simultaneously:

1. They are learning about ISO 14001;

2. They are establishing and attempting to achieve environmental objectives and targets; and

3. They are drafting policies and procedures to apply to future iterations of the EMS.

These tasks represent considerable work. Because of the magnitude of the first implementation, organizations should use care to ensure that they don't take on more than they can realistically achieve. It helps occasionally to take a step back to assess the situation while being prepared to back off if the implementation becomes too ambitious.

A Note on EMS Cycles – While some procedures in ISO 14001 are required to be exercised periodically, there is nothing in ISO 14001 itself that requires the EMS to be placed on an annual cycle. The norm for organizations implementing an EMS, however, is that they integrate the EMS with other business systems that coincide with their financial year. (See Integration with Other Management Systems, p. 51)

Top Management Involvement – Experience indicates that direct top management involvement is the single most important factor in successful implementation of ISO 14001. Top management has four specific responsibilities under ISO 14001:

1. Defining the organization's Environmental Policy;

2. Defining roles, responsibilities, and authorities in order to facilitate effective environmental management;

Top Management Involvement
Of the 45 organizations in the database, 8 were judged to have had insufficient top management support for the implementation of ISO 14001. All 8 had the initial tacit support of management to implement ISO 14001 but not demonstrable actual support. All put considerable time and effort into ISO 14001 implementation up until the point where lack of top management support became critical to completion. Two organizations completed their implementation projects in spite of the lack of top management support; one because it was a commercial necessity and the other because a lower-ranking manager pushed the EMS through.

An example: one organization formed a 14-member implementation team that put approximately 475 hours into implementation before learning that its board would not approve an environmental policy for the organization.

3. Providing human, financial, and technical resources and organizational infrastructure for establishing and maintaining the EMS; and

4. Reviewing the EMS at planned intervals to ensure its continuing suitability, adequacy, and effectiveness.

ISO 14001 does not define or designate 'top management'. It is inferable, however, that only the person(s) having sufficient responsibility and authority to execute the top management responsibilities at his or her own initiative constitutes top management of the organization. Judging from these responsibilities, top management is the functional equivalent of the Chief Executive Officer or a designated member or committee of the Board of Directors in a large organization. In some organizations, the first three responsibilities are dual responsibilities of the CEO and the Board and the fourth is often delegated to a separate review committee that includes, among others, the CEO, COO, or a Board member.

Who top management is also depends on the defined scope of the organization (see *Defining 'Scope'*, below) for ISO 14001 purposes. If the organization implementing ISO 14001 is an entire corporation, then the CEO would be top management. If the organization is defined, for example, as a division of a corporation or a campus of a university, then the Division President or the Chancellor would be top management. If the organization is a single plant facility, then the Plant Manager would be top management.

Most often, ISO 14001 is being implemented at the facility level. The facility manager is top management but the norm for management of the facility is to manage through a team of upper level managers who make decisions for the operation of the organization on a collegial basis. The facility management team participates in the EMS functions described above and makes key decisions related to the EMS. The team itself, however, is usually not empowered to make decisions for the organization without the participation of the facility manager.

Defining 'Organization' – Organizations begin ISO 14001 implementation by determining what is meant by 'organization'. ISO 14001 says that an organization is any entity "that has its own functions and administration." In implementing ISO 14001, the definition of the organization determines how extensively the organization will be covered by the EMS.

An illustration of the poles of organization occurred with the differing approaches taken by Ford and IBM, each of whom were among the first to register their entire organizations to ISO 14001 and each having 130 – 140 facilities worldwide. Ford defined a decentralized "organization" and implemented and registered to ISO 14001 at each facility individually. IBM defined a centralized "organization" and implemented the same policies and procedures throughout the entire corporation, registering collectively to ISO 14001. Thus, Ford defined itself as 140 separate organizations; IBM defined itself as one.

Defining 'Scope' – §1, Scope, last paragraph says, "All the requirements in this International standard are intended to be incorporated into any environmental management system. The extent of the application depends upon factors such as the environmental policy of the organization, the

nature of its activities, products, and services, and the location where and the conditions in which it functions." §4.1, General Requirements, states, "The organization shall define and document the scope of its environmental management system."

Once the organization defines itself, the scope of application of the EMS should be virtually automatic. Usually, scope includes everything within the fence line of the facility and scope is synonymous with organization. Questions arise when parts of the organization are outside the fence line but are related to the core organization in varying degrees. For example, a warehouse several miles from the main facility would probably be included in the definition of organization and the scope of the implementation. A sales office in a distant city might be part of the organization but not included in the scope of the EMS because a reasonable span of management control is not present. These determinations are made individually by the organization when it considers implementation. ISO 14001 does not require that the scope of implementation cover the entire organization but any carve outs should be supported by sound reasoning. A decision to exclude from the scope a plating operation located outside the fence line but, nevertheless, a key part of the organization would not be a good faith determination of scope.

Involving the Entire Organization – Because ISO 14001 is a management system that addresses all of the environmental aspects of the organization's activities, products, and services, all functions and levels of the organization should be involved in implementing the EMS, including:

- Purchasing
- Research and Development
- Finance
- Administration
- Production
- Health & Safety
- Quality Assurance
- Human Resources
- Shipping/Receiving/Warehousing
- Waste Management
- Training
- Risk Management
- Maintenance
- Legal
- Sales and Marketing

Defining "Relevant Functions and Levels" – ISO 14001 has several requirements that are to be carried out at "relevant functions and levels of the organization." These are the requirements to:

1. Establish objectives and targets,

2. Designate responsibility for achieving objectives and targets, and

3. Communicate internally among the various functions and levels.

At the time that the organization defines "organization" for ISO 14001 purposes, it should also determine what the relevant functions and levels of the organization are. Relevant functions and levels are usually indicated by the organization's preexisting structure as defined by separate process or product groups, departments, or physical locations and as modified by the needs of environmental management. For example, if we consider the list of functional departments shown in the preceding section, we might determine that the relevant functions for environmental management purposes would be Production, Maintenance, Waste Management, Shipping/Receiving/Warehousing, and Research and Development, and that all of the other departments would be considered together as an administrative group. Thus, fourteen departments would be regarded as six functional areas for purposes of the EMS.

* * *

After considering the foregoing issues, the organization is in a better place to decide if ISO 14001 implementation is right for it. If the answer is yes, then the organization can consider how to approach implementation.

Implementation Approaches

There is a multitude of ways for organizations to implement ISO 14001. The best approach is beginning with what seems most natural for the organization. Approaches to starting ISO 14001 implementation include:

Formation of an Implementation Team - In preparing for ISO 14001 implementation, the organization usually forms an Implementation Team supported by representatives from the organization's various functions and levels. Some organizations include outside professionals on their implementation team so as to gain the benefit of their specialized knowledge and skills. Environmental lawyers, environmental consultants, process engineers, and professional facilitators are sometimes included as team members. External ISO 14001 training may be provided for the implementation team members to ensure that there is a consistent level of knowledge among all team members.

Implementation Team Size

Of 45 organizations in the database, the average implementation team size was 7.0 with a range from 1 to 31.

Implementation team size per 100 employees averaged 1.3.

Two implementation team members is the absolute minimum for successful implementation.

In forming the implementation team, it is important to get adequate representation of the organization's relevant functions and levels. Many organizations limit their implementation teams to members of the Environmental, Health, and Safety (EHS) Department. Experience indicates that this approach is too narrow and often leads to an EMS that is the province of the EHS Department when it should be inclusive of the entire organization.

One way to avoid establishing a narrow implementation team is to determine at the outset which team members will speak for each relevant function of the organization. Can this team member establish objectives and targets for that function? Can this team member designate responsibility

for achieving objectives and targets within the functional area? Is the team member necessary for execution of a specific EMS function such as the head of the safety committee to work on the Emergency Preparedness and Response requirements?

"Gap" Analysis of EMS Requirements – A logical beginning, especially for organizations having an informal EMS in place, is to perform a gap analysis comparing the organization's existing policies and procedures to the requirements of ISO 14001. The gap analysis determines which policies and procedures have been established, which have not, and what needs to be done to establish them all.

Environmental Aspects – Some organizations proceed by choosing one element of ISO 14001 and using that as the first step in progressive implementation. Exercising the ISO 14001 procedure for environmental aspects, §4.3.1, is an example. When an organization identifies its environmental aspects and determines which are significant, it positions itself to set priorities and to plan for eliminating or mitigating its significant environmental aspects. In implementing this procedure, the organization would also see the logic of implementing Objectives, Targets, and Programs at the same time. Because the elements of ISO 14001 are interrelated, starting with one core procedure like environmental aspects can lead, one element at a time, to full implementation of ISO 14001.

Environmental Performance Audit – An environmental performance audit looks at the environmental impacts of an organization from the standpoint of pre-established criteria such as applicable environmental regulations and then uses the audit as a baseline from which performance improvements can be made. For example, if a finding of a performance audit at a marine transfer terminal for petroleum products is that there is a high probability of an oil spill, that finding would logically be the predicate for implementing §4.4.7, Emergency Preparedness and Response.

Establishment of Environmental Performance Indicators – An organization can begin EMS implementation by establishing indicators of environmental performance as a benchmark against which to measure and improve future performance. The performance indicators can be broadened to encompass additional areas of environmental performance and, gradually, other procedures of the environmental management system. For example, operator training might remedy an indicator exceeded as a consequence of poor operator performance. Recognizing this need for training could lead to implementing §4.4.2, Competence, Training, and Awareness.

Migration from ISO 9001 – Some elements of the ISO 9001 Quality Management System are similar to requirements of ISO 14001 and can be used as the foundation for implementing ISO 14001. For example, an organization that has implemented ISO 9001 will have established documentation, document control, and record keeping procedures that satisfy the requirements of ISO 14001.

The third edition of ISO 9001, ISO 9001:2000, "has been [specifically] aligned with ISO 14001:1996 in order to enhance the compatibility of the two standards for the benefit of the user community." The second edition of ISO 14001 "has taken due consideration of the provisions of

ISO 9001 to enhance the compatibility of the two standards for the benefit of the user community."

Corporate Environmental Reports – Many industrial corporations, in an effort to demonstrate their environmental stewardship, report to stakeholders about corporate environmental activities in an annual environmental report. The Corporate Environmental Report (CER) or the Corporate Social Responsibility Report (CSR) is sometimes motivated by competitive circumstances or by a desire for positive publicity on environmental performance. In either event, the organization wants to be perceived as achieving excellence in environmental performance. The organization typically includes an environmental goals section in the report; this is a good place to set a goal of implementing all or part of ISO 14001.

Sustainable Development – Some organizations have leapfrogged beyond primary concern for environmental performance to focus on achieving sustainability through balanced progress on economic, environmental, and social goals. Organizations interested in putting sustainability in the forefront often use the economic, environmental, and social performance indicators developed by the Global Reporting Initiative (www.globalreporting.org). In moving ahead to sustainability, it makes sense to put the sustainability framework in place and to then backtrack and infill environmental management with ISO 14001.

Implementation Plan

There is no right or wrong way to begin ISO 14001 implementation. A key to successfully implementing ISO 14001 is to begin at the point in the organization where success is most likely to be achieved and to not overreach. It is much better to start with a small part of ISO 14001 and to use that as the basis for successfully adopting, over time, the entire standard than to try to implement the whole standard at once and find it too daunting a task.

Issues to Consider in the Implementation Plan:

- Views of interested parties
- Status of existing management systems
- Results of initial gap analysis and environmental aspects identification
- List of candidates for EMS management representative
- ISO 14001 requirements
- Interest of top management

Once the organization has determined what policies and procedures must be instituted to conform to ISO 14001's requirements, it can develop a plan for moving forward with the EMS. An EMS implementation plan provides a tangible reference point when business contingencies deflect attention from EMS goals. Plan development is also a useful tool for ensuring that top management and the implementation team have a consistent commitment, and an understanding of the purposes of the EMS and the benefits of ISO 14001.

The implementation approach taken by this handbook is 1) to establish the fundamental elements of a functional ISO 14001 EMS and, then, 2) to add increments that will improve its operation. This approach is based on a finding that many organizations are intimidated by the idea of implementing a seventeen-element system at one time.

Getting Started Worksheet

This worksheet is intended to guide the organization in making its initial decisions about the EMS.

Reasons for Implementation

Describe the reasons why your organization is considering implementing ISO 14001: _____
_____
_____

Is the organization motivated to implement ISO 14001 because of any governmental incentive? _____

Is there an environmental agency program providing benefits for implementation of ISO 14001? _____

Is a government agency a customer that will consider an EMS in its procurement policies? _____

Is the organization subject to a Supplemental Environmental Project requiring implementation of an EMS as part of a consent agreement? _____
_____

Is the organization the recipient of a Notice of Violation from an environmental agency? _____

Is the organization subject to any circumstances that would make implementation of ISO 14001 a commercial necessity? _____
_____

Is a customer requiring or likely to require implementation of ISO 14001? _____
_____

Is the organization in an industry where the top organizations have implemented ISO 14001? _____

Is the organization in an industry where implementation of ISO 14001 would positively differentiate it from its competitors? _____
_____

Is the organization likely to be the target of any environmental or social organizations that are concerned with improving environmental performance? _____
_____

Is top management of the organization personally concerned with the organization's environmental performance or with environmental issues generally? _____
_____

What external organizations are interested in the environmental performance of the organization?

Community groups?
Suppliers?
Shareholders?
Bankers?
Insurers?

Top Management Responsibilities

Who, of his/her own volition, has the authority to define and issue an Environmental Policy for the organization? _____

Who, of his/her own volition, has the authority to define roles, responsibilities, and authorities for implementing an EMS? _____

Who, of his/her own volition, has the authority to provide human, financial, and technical resources and organizational infrastructure for the establishment and maintenance of the EMS? _____

Who, of his/her own volition, has the authority to review the EMS for suitability, adequacy, and effectiveness and to direct changes as necessary? _____

Definition of the Organization

Describe the physical attributes of the organization:

How many buildings? Size? Occupancy? Facility size in acres? Ratio of facility pervious to impervious surfaces.

No. of employees? Shifts? Commutation circumstances?

Electric energy fuel source?

Thermal energy fuel source?

Activities taking place within the organization?

Products offered?

Services offered?

Does the scope of the implementation contemplate all of the organization? _____

Relevant Functions and Levels

Describe the levels of the organization: _____
_____

For purposes of the EMS, are any of these levels combinable? _____
_____

Identify and describe the various functional areas within each level: _____
_____
_____
_____

For purposes of the EMS, are any of these functional areas combinable? _____
_____

Based on the outcome of the preceding questions, what are the relevant functions and levels of the EMS? _____
_____
_____

Implementation Team

Who are the members of the EMS implementation team and which functions and areas do they represent? _____
_____
_____
_____

Are all of the relevant functions and levels represented on the EMS implementation team? _____

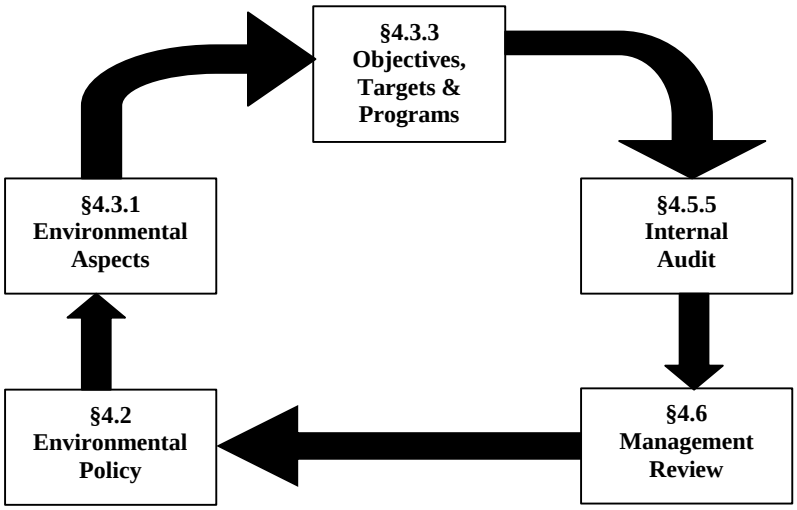
If not, how will the interests of any unrepresented relevant functions and levels be represented in establishment of environmental objectives and targets, environmental management programs, and internal communication? _____ _____
_____
_____

Implementation Plan

Describe the organization's plans for implementation of ISO 14001? _____
_____
_____
_____

III. Core Elements – Environmental Policy, Environmental Aspects, Objectives and Targets, Environmental Management Programs, Internal Audit, Management Review, and Integration with other Management Systems

A functional, ISO 14001-based EMS can consist of no more than the five elements described in this section. Any organization that implements these five elements will have started on the road to improving environmental performance and will at the same time be embedding systems management techniques that benefit other areas of organizational performance.



1. The Environmental Policy (ISO 14001:2004, §4.2)

Aligning the Environmental Policy with the Vision and Mission Statements – Although it is not an ISO 14001 requirement, it makes sense for the organization to establish continuity between the Vision, Mission, and Environmental Policy Statements.

Defining the Environmental Policy – ISO 14001 requires that "top management" define the organization's environmental policy (§4.2, first sentence) and that it be appropriate to the nature, scale, and activities of the organization (§4.2.a). The environmental policy then becomes the foundation for carrying out environmental management, providing "the framework for setting and reviewing environmental objectives and targets" (§4.2.d). By requiring top management to define the policy, ISO 14001 establishes environmental management as a "top down" business function.

In defining the environmental policy, top management articulates the organization's intentions and direction with respect to its environmental performance (see definition of *environmental policy*, §3.1).

If environmental intentions and direction haven't yet been articulated, defining the environmental policy provides an opportunity for the organization to consider what its

environmental principles and values are and, from there, determine intentions and direction. When environmental principles and values are not explicitly defined, business decisions are often made solely on the basis of economic benefit. The aim of ISO 14001, however, as stated in its Introduction, "is to support environmental protection and prevention of pollution in balance with socioeconomic needs."

Examples of Intentions and Direction

"Bethlehem Steel is committed to conducting its business safely and in an ethically, socially, and environmentally responsible manner that will protect human health, natural resources, and the environment in which we live… We will balance our economic, social, and environmental goals and responsibilities in order to profitably achieve growth in our company that is sustainable." Bethlehem Steel Environmental Policy, 2001

"It is the policy of **Motorola, Inc.** to conduct all business activities in a responsible manner, free from recognized hazards; to respect the environment, health and safety of our employees, customers, suppliers, partners and community neighbors; to foster the sustainable use of the earth's resources; and to comply with applicable environmental, health and safety laws and regulations of the countries in which we operate." Motorola, Inc. Environmental Policy, 2 April 2003

"McDonald's believes it has a special responsibility to protect our environment for future generations. This responsibility is derived from our unique relationship with millions of consumers worldwide, whose quality of life tomorrow will be affected by our stewardship of the environment today. We share their belief that the right to exist in an environment of clean air, clean earth and clean water is fundamental and unwavering. McDonald's Environmental Policy, updated May 2003

Although top management is charged with defining the environmental policy, the usual practice of organizations is for the EMS implementation team to draft the policy and submit it to top management for its review, approval, and issuance. Approval of the environmental policy is often a barometer of management support for the EMS – experience indicates that when the policy is not promptly approved or the implementation team shows reluctance to submit the draft policy to top management, it is an indication of lack of management support for the EMS.

The environmental policy must reflect three "commitments" central to ISO 14001. They are:

Commitment to continual improvement – The required commitment to continual improvement is intended to be a commitment to continual improvement of the environmental management *system* itself (see definition of *continual improvement*, §3.2). The EMS is improved in order to achieve corresponding performance improvements. The organization is free to determine which elements of the EMS to improve, in what magnitude, and at what pace.

Commitment to prevention of pollution – The intent of the prevention of pollution commitment is to establish a preference for reducing or eliminating adverse environmental aspects through front-end materials reductions and process changes rather than end-of-pipe, after-the-fact capture of pollutants. The commitment to prevention of pollution is fulfilled when the organization establishes its

'Other' Environmental Legal Requirements

There are no guidelines or definitions within ISO 14001 for what is meant by 'other' requirements.

The following definition of other requirements has been developed to offer organizations an interpretation of what is meant by the requirement to comply "with other requirements to which the organization subscribes":

Those affiliations, endorsements, commitments, contracts, pledges, customer or parent company requirements, made by or on behalf of the organization that relate to the organization's stewardship of the environment.

objectives and targets and specifically addresses the requirement (see Objectives, Targets, and Programs, §4.3.3) that they "be consistent with the environmental policy, including the commitment to prevention of pollution."

Commitment to comply with applicable legal requirements and with other requirements to which the organization subscribes which relate to its environmental aspects – The commitment to comply with environmental legislation, regulations, and other requirements(ISO 14001, §4.2); the requirement "to identify and have access to the applicable legal and other requirements" (ISO 14001, §4.3.2); and the requirement to periodically evaluate compliance with applicable legal requirements (ISO 14001, §4.5.2), ensure that an organization that has implemented ISO 14001 understands what its environmental legal requirements are and that it is doing what is necessary to comply with these requirements. These requirements, taken together, have allowed environmental agencies to support the ISO 14001 approach to environmental management without undermining their interest in regulatory methods for achieving environmental performance improvements.[2] It should be kept in mind, however, that the policy commitment is to comply, and does not imply present compliance, nor guarantee future compliance, *per se*.

Establishing the regulatory compliance commitment sufficiently to satisfy ISO 14001 requires 1) identification of applicable regulations and other requirements, 2) determination as to how they apply within the organization, 3) a record of which ones the organization is in compliance with, and 4) a plan to achieve compliance where compliance does not yet exist.

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[2] **U.S. EPA's Statement of Principles:**

- EPA's overall policy on Environmental Management Systems, like the EMS approach itself, will be guided by the principles of continual improvement and learning, flexibility, and collaboration.
- EPA will encourage wide spread use of EMSs across a range of organizations and settings, with particular emphasis on adoption of EMSs to achieve improved environmental performance and compliance, pollution prevention through source reduction, and continual improvement. We will support EMSs that are appropriate to the needs and characteristics of specific sectors and facilities.
- EPA will encourage organizations that use EMSs to obtain stakeholder input on matters relevant to the development and implementation of an EMS, and demonstrate accountability for the performance outcomes of their EMSs through measurable objectives and targets. Additionally, we will encourage organizations to share information on the performance of their EMSs with the public and government agencies, and facilitate this process where practicable.
- EPA will encourage the use of recognized environmental management frameworks, such as the ISO 14001 standard, as a basis for designing and implementing EMSs that aim to achieve outcomes aligned with the Nation's environmental policy goals and the principles of this Position Statement.
- EPA will work collaboratively with other key partners–including states, tribes, localities, industry, and non-governmental organizations—as we implement this policy. EPA will support international EMS initiatives that will assist in increasing the use of EMSs in the United States. We will ensure that our decisions and our work as we implement this policy are transparent to all interested parties.
- EPA will lead by example, by implementing EMSs at appropriate EPA facilities.
- EPA will foster continual learning by supporting research and public dialogue on EMSs that help improve our understanding of circumstances where EMSs can advance the Nation's environmental policy goals. We will strive to collect better information on the application of EMSs, including how well EMSs meet environmental performance expectations; and the costs and benefits to organizations and the environment.

From EPA's EMS Position Statement, dated May 15, 2002, and signed by Christine Todd Whitman, Administrator. Viewed on EPA's website, http://www.epa.gov/ems/policy/position.htm, December 27, 2003.

Other Commitments

In addition to commitments to compliance with environmental regulations, continual improvement, and pollution prevention, top management may elect to define in the environmental policy additional commitments not required by ISO 14001 but representative of the organization's intentions and direction, for example:

- To be accountable for the adverse environmental impacts of the organization's activities and operations;
- To the extent that the organization's adverse environmental impacts involve costs borne by society ("externalities"), to identify and manage such externalities;
- Where externalities are the consequence of contributions from other organizations in addition to the subject organization, to initiate or cooperate with joint actions aimed at eliminating common environmental impacts;
- To periodically publicly disclose significant environmental aspects, objectives and targets, and progress in achieving objectives and targets; and
- To freely share with other organizations knowledge gained about the management of environmental performance.

The Environmental Policy is also the vehicle for establishing other environmental management requirements:

Framework for Objectives and Targets – The environmental policy requirement stipulates that the policy provide *"the framework for setting and reviewing environmental objectives and targets"* (§4.2(d)). The environmental policy provides this framework when it is to the EMS as the constitution is to the laws of a country – a basic foundation describing in broad terms the goals, principles, and practices of the organization for environmental management. Objectives and targets are established within the context of this framework. The environmental policy is effective as a framework when members of the organization at the various functions and levels are able to understand from reading the environmental policy, what top management intends for them to do in setting and reviewing environmental objectives and targets.

Documented and Communicated – ISO 14001 requires that the environmental policy be "documented, implemented, maintained"… and "communicated to all persons working for it or on its behalf" (§4.2.f). ISO 14001 does not prescribe *how* the Policy is to be communicated to all persons working on its behalf, allowing the organization to communicate to its personnel in a manner that is best for the organization. The intention of the requirement to communicate the environmental policy appears, however, (based on the relative uses of 'communicate', 'aware', and 'available' within ISO 14001) to mean communication in the sense of achieving understanding, not just relaying information or making information

How organizations communicate the Environmental Policy to employees:

- Using environmental awareness sessions to discuss in detail the meaning of the policy;
- Having individual employees become responsible for understanding parts of the policy and explaining it to coworkers;
- Making the policy the centerpoint of a video on environmental awareness; and
- Embedding the policy in programmed learning sessions on the organization's Intranet.

How organizations make the Environmental Policy available to the public:

- Posting on websites;
- Having copies available in the reception area;
- Letters to customers and suppliers;
- Having all employees sign the policy and then blowing it up, framing it, and posting it in a prominent spot on the premises; and
- Inclusion in product or service brochures.

available.

Available to the Public – The policy must be made *available* to the public (§4.2.g). The policy does not have to be issued publicly, but it does have to be available to the public. Note that this requirement of public availability applies only to the Environmental Policy – with the exception of the requirement to respond to "relevant communication from external interested parties," (§4.4.3.b) nothing else in ISO 14001 compels further public disclosure of EMS-generated information.

Nature, Scale, and Environmental Impacts – The issues addressed in the policy depend on the nature, scale, and environmental impacts of the organization and its activities, products, and services (§4.2(a)). At the initial developmental stages of the EMS, the nature, scale, and environmental impacts of the organization's activities, products, and services may not be fully appreciated. ISO 14001 broadens the organization's environmental outlook from primary concern for regulatory compliance to concern for the many ways in which the organization can positively influence overall environmental performance, especially resource and energy conservation. A reasonable approach is to base the initial environmental policy on the organization's sense of what the nature, scale, and size of its environmental impacts are and, then, to modify the policy, as appropriate, following the first Management Review.

Nature, Scale, and Environmental Impact Examples

"The **Naval Undersea Warfare Center Division, Newport**'s ability to conduct its mission requires daily operation in the land, sea, and air environments. Protection of the environment is an integral part of its role in accomplishing its mission." 28 August 2002

"We realize that, in today's world, a business leader must be an environmental leader as well. Hence our determination is to analyze every aspect of our business in terms of its impact on the environment and to take actions beyond what is expected if they hold the prospect of leaving future generations an environmentally sound world." **McDonald's,** May 2003

Whether the environmental policy is appropriate to the nature, scale, and environmental impacts of the organization usually requires a reading of the policy as a whole. The box above captures the ways in which two organizations have dealt with the requirement in a short statement.

Common Pitfalls – As mentioned in the foregoing, the usual way in which an environmental policy gets defined is by the committee or team responsible for implementing the EMS. Typically, this committee drafts a policy and then sends it to a senior management committee for vetting and signing by top management. This second committee may or may not give the policy thorough attention. When the environmental policy is not given thorough top management review, unwanted results can occur. Some of the pitfalls include:

- Failure to review the environmental policy for grammar and usage before issuance;
- Failure to check the environmental policy for consistency with other externally issued documents such as the SEC 10K;
- Commitments that may be impractical to carryout such as a commitment to deal only with like-minded organizations;

- Overstatement of intentions toward environmental performance such as commitments to exceed regulatory requirements (because the organization will be held to its statements by registration auditors); and
- Failure to connect the environmental policy in a logical chain of documents with the Mission and Vision statements.

Finally, the Environmental Policy should be a simple, direct statement of environmental stewardship on which readers can rely. It should not be a manifesto declaring aspirations that sound good but that have little likelihood of being achieved. A good example of an environmental policy is that articulated by Smiths Detection – Edgewood, reprinted here with permission of its management:

Environmental Policy

We, at Smiths Detection -- Edgewood, are committed to conducting our business in an ethically and socially responsible manner and in ways that respect the environment, including adherence to the principles of product stewardship.

Compliance

We will comply with all applicable local, state, and federal laws and regulations and with the other requirements to which we subscribe that are relevant to the environmental aspects of our activities, products, and services. We will implement and maintain programs and procedures to assure our compliance with such laws, regulations, and other requirements in our business and encourage such compliance from those organizations with whom we do business.

Pollution Prevention

We will actively seek to prevent pollution before it is produced and to minimize our impact on the environment by establishing environmental objectives and targets aimed at improving our overall environmental performance. We will consider environmental factors when we plan, purchase, or make operating decisions.

Awareness

We will communicate this Environmental Policy to employees, contractors, and suppliers to ensure their awareness of our commitment to the environment. We will provide appropriate training to all employees to ensure their continuing awareness of environmental responsibilities.

Continual Improvement

We will evaluate and continually improve the effectiveness of our environmental management system through periodic audits, management reviews, and by achieving our environmental objectives. We will review this Environmental Policy annually and make it available to the public.

Robert Judd, President
Smiths Detection – Edgewood

Environmental Policy Worksheet

The following questions are intended to elicit information useful in completing the organization's environmental policy. The answers to these questions will bring together the information necessary to drafting an environmental policy.

Process for Defining the Environmental Policy

Describe the internal process for drafting the environmental policy: _____
_____
_____

Will the implementation team do an initial draft? _____

What will top management's involvement in defining the environmental policy be? _____
_____

Determining Intentions and Direction toward Environmental Performance

Describe the organization's intentions and direction toward environmental performance: _____
_____
_____

How will these intentions and direction be stated in the environmental policy? _____
_____

Framework for Action and for Setting Environmental Objectives and Targets

How will the intentions and direction become a framework for action and for setting environmental objectives and targets? _____
_____
_____

Commitment to Continual Improvement

Describe the organization's planned commitment to continual improvement of the EMS: _____
_____
_____

Commitment to Prevention of Pollution

Describe how the organization will carryout its commitment to prevention of pollution:
_____
_____

Commitment to Comply with Applicable Legal Requirements and Other Requirements

Describe how the organization plans to carryout its commitment to complying with applicable laws, regulations, and other requirements: _____
_____
_____

Other Commitments

Does the organization plan to make any other commitments to environmental performance? ____

If yes, what are they? _____
_____
_____

Document and Communicate

How will the organization document the environmental policy? _____
_____

How will the organization communicate the environmental policy to all persons working for or on behalf of the organization? _____
_____

Public Availability

How will the organization make the environmental policy available to the public? _____
_____

Appropriate to the Nature, Scale, and Environmental Impacts

Will the environmental policy contain an explicit statement concerning the nature, scale, and environmental impacts of its activities, products, or services? _____

In the judgment of those drafting the policy, is the policy taken as a whole appropriate to the nature, scale, and environmental impacts of the organization's activities, products, and services? _____

Compatibility with other External Documents

What other documents of the organization commenting on environmental performance are easily available to the public? _____
_____
_____

Have these documents been reviewed for consistency with the environmental policy? _____

Consistency with Mission and Vision

When the environmental policy is read with the mission and vision statements, does the environmental policy bear a relationship to the other two so that they form a consistent family of documents? _____

Parent Organization Considerations

Is the organization the subsidiary of a larger organization that has an environmental or sustainability program? _____

How do those programs apply to the organization? _____
_____

Does the environmental policy need to be modified in any way to accommodate to the larger organization? _____

If "yes," how should it be modified? _____
_____
_____

2. Environmental Aspects (ISO 14001:2004, §4.3.1)

The requirement of §4.3.1 of ISO 14001 is to establish and maintain procedures 1) for identifying the environmental aspects of the organization's activities, products, and services that it can control and those that it can influence and 2) for determining which of those aspects have or can have a significant impact on the environment. Understanding the requirement of this element of ISO 14001 is central to understanding the concept of an environmental management system.

1. A single manufacturing facility has potentially hundreds of environmental aspects. How far must it go in identifying its environmental aspects to satisfy the terms of the requirement? ISO 14001 specifies that the organization is to identify those aspects that it can control and those that it can influence and that it must also take into account planned or new developments and new or modified activities, products, and services. These stipulations in the requirements, without actually drawing boundaries on how far the organization must go in identifying environmental aspects, at least establish some categories of aspect that must be considered. Beyond this principle, each organization must identify its aspects comprehensively enough so as to not fail to identify a significant aspect or a legal requirement. An objection to comprehensive identification of aspects is that the organization may become so immersed in aspects identification that it loses sight of the end objective of the procedure, which is to determine significance.

Environmental Aspects

Drawing from the database of 45 organizations, the average number of environmental aspects identified per organization is 24 and the range is from 3 to 119.

Most of these aspects were identified under the requirements of ISO 14001:1996, which required the organization to identify its environmental aspects *in order to* determine which were significant. Presumably, under ISO 14001:1996 the organization did not have to identify all of its aspects to determine those that were significant.

The aspects identification requirement of ISO 14001:2004 is independent of the determination of significance. It is probable that registration auditors will expect to see a fuller identification of aspects than that necessary just to determine significance.

The definition, however, of *aspect* used to arrive at the database averages was not uniform – some organizations identified major categories of aspect and, thus, identified low numbers of aspects, while others identified in greater detail and achieved higher numbers of aspects. The number of aspects identified is not as meaningful as the number of significant aspects identified. (See the text box below)

2. "Significant impact" is not a stand-alone term in §4.3.1. It is accompanied by the phrase "impact on the environment" and "environment" is a defined term (see definition of *environment*, §3.5). Significant aspects, then, are those environmental aspects that have or can have significant impacts on air, water, land, natural resources, flora, fauna, and humans. The organization determines, using its own criteria, what magnitude of impact on these seven environmental receptors constitutes a significant impact. Whether an aspect is regulated is not intended to be a factor in determining significance.

Significant Aspects

Drawing from the database of 45 organizations, the average number of significant aspects determined per organization is 3.3 and the range is 0 to 16.

Five organizations of the 45 determined that they had no significant aspects.

The organization having determined that 16 aspects were significant is an outlier; the next largest was 8.

3. Proper execution of the environmental aspects procedure is important, in part, because it lifts environmental management out of the regulatory compliance mode and into the mode of *systematically* identifying environmental aspects and impacts and considering their consequences for the environment, irrespective of regulation. The organization that rigorously applies the environmental aspects procedure discovers many opportunities to improve environmental performance that regulation does not address, including:

    - Use of energy
    - Consumption of materials
    - Environmental impacts of employee activities
    - Environmental impacts of products and by-products post-manufacture, including distribution, use, reuse, and disposal
    - Environmental impacts of services
    - Unregulated waste streams such as carbon dioxide

Aspects *vs.* Impacts – Environmental aspects and environmental impacts differ by definition from one another in that an aspect is an "element of an organization's activities, products or services that *can interact* (emphasis added) with the environment" while an impact is "*any change* (emphasis added) to the environment… resulting from an organization's environmental aspects." An *aspect*, then, is a precursor to an impact and an *impact* occurs when the aspect interacts with and changes the environment.

When identifying its aspects and impacts, the organization may find that there are more than one potential impacts associated with any given aspect. For example, an environmental aspect of a coal-fired power generation facility is stack emissions containing sulfur dioxide, nitrogen oxides, mercury, and carbon. These emissions change the environment and become impacts by contaminating plants, soil, and surface waters; contributing to the formation of ground-level ozone; causing or exacerbating heart and lung disease in humans; entering the aquatic food chain and impairing reproductive, immune, and endocrine systems; and contributing to the increase in atmospheric carbon dioxide leading to global warming. One aspect, stack emissions, then can generate at least five impacts.

Beneficial Impacts – ISO 14001 alludes to beneficial environmental impacts in the definition of environmental impact (see definition of *environmental impact,* §3.7) but does not refer to the term within the §4 requirements. It is logical to conclude that what is intended is the acknowledgement of the existence of impacts that have positive consequences for the environment and that, perhaps, this inclusion in the definition is intended as a prompt for organizations to create beneficial environmental impacts.

Some organizations, such as low-impact service organizations, may find that their adverse environmental aspects are so minimal, diffuse, or irreducible that they are better off focusing on the *pro bono* creation of beneficial impacts rather than trying to eliminate what is already nominal.

Other organizations, applying benefit/cost analyses to their corrective actions, may discover that creation of a beneficial impact provides a greater environmental benefit than elimination of an adverse impact.

The introduction of the beneficial environmental impact concept into the ISO 14001 Terms and Definitions suggests that it was considered by some of the ISO 14001:1996 drafters as a placeholder for the future possibility of offsetting adverse impacts with beneficial and, on balance, achieving an environmentally neutral organization.

Beneficial Environmental Impact Example: South American Oil Refinery

An oil refinery engaged an independent audit of its environmental performance. One of the recommendations from the audit was to upgrade, at a cost of $5 million, processing equipment in order to reduce air emissions. Local environmental regulations did not require the equipment upgrade and other nearby facilities were emitting similar contaminants so that installation of this equipment would produce only an incremental improvement in environmental impacts.

The refinery's management elected, instead, to spend $5 million on the remediation of a waste pit and creation of a biodiversity-rich lagoon in its place. Management calculated that the ecological *benefit* value of the lagoon over a 10-year period was approximately $75 million while the emissions control device would eliminate an adverse environmental impact valued at $15 million over the same period. This choice of action yielded a benefit/cost ratio for deployed capital of 15/1 as opposed to the 3/1 opportunity available from correcting the adverse impact.

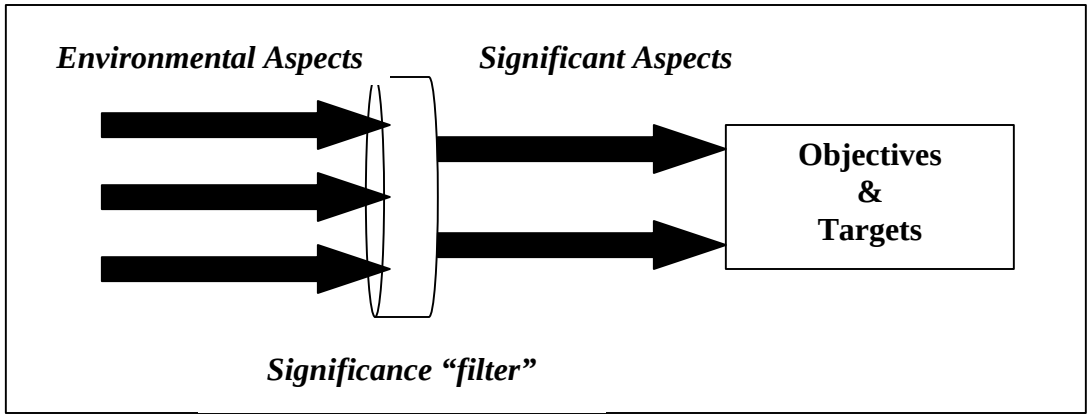
Control and Influence – The environmental aspects procedure requires the organization to identify those environmental aspects "that it can control and those that it can influence." Circumstances where control and influence are considered separately can occur where the environmental aspects of products or services are concerned. Some examples illustrate the case:

1. **No control, no influence –** When an organization manufactures a product, such as lumber, and sells it to a customer that can use the product in any way that it wishes, the organization has no control over the environmental aspects of the product's use. The customer could use the product benignly as in the manufacture of a table or to damage the environment by burning the lumber and releasing its carbon into the atmosphere. In this case, the organization would not be expected to have either control or influence over the environmental aspects of the product.

2. **Control, no influence –** When an organization's environmental aspect is the use of electric power generated from coal, it may be able to control its use of electric power by using less, by buying from a different, less environmentally damaging source, or by generating its own power. Rarely, however, does the organization have influence over the power generator to an extent that it could influence it to reduce the environmental impacts of power production.

3. **Influence, no control –** When an organization manufactures a product, such as an automobile, which is sold to the customer without restrictions on its use, the organization may be said to have no control over the environmental aspects of the product's use. The organization may, however, be able to assert influence with the inclusion of owner's manuals containing instructions for low impact use of the product.

4. **Control and influence –** When an organization buys a product built to its specifications, it has *control* over the products' environmental aspects in the sense that it can determine the environmental aspects of the product. In this case, control also includes influence.



Significant Impacts – ISO 14001 does not provide guidance as to what constitutes a "significant impact on the environment", leaving that determination to the organization.

Many organizations ignore the qualifying phrase, "impact on the environment", and add additional criteria to what they determine to be significant impacts. For example, many organizations decide that aspects that are the subject of regulation, irrespective of impact to the environment, or that can cause damage to business reputation, are significant. Legal requirements, however, are identified in §4.3.2 and legal requirements and business requirements are specifically considered when the organization establishes its objectives and targets (§4.3.3). Adding criteria that are not relevant to impact on the environment in the determination of significance distorts the outcome of procedures for environmental aspects and objectives and targets by giving these criteria undue weight in the determination of significance. For example, an environmental aspect that is significant only because its disclosure might affect the organization's reputation is best dealt with in the Public Relations Department rather than as an environmental aspect.

Business Reputation Aspect Example

A major manufacturer did most of its manufacturing in semi-arid regions of the U.S. It was typically the largest consumer of water where its plants were located. Periodically, local newspapers would print articles critical of the organization for excessive water use.

Because of this adverse publicity, the ISO 14001 Team determined that water use was a significant aspect. When the team looked more closely at the aspect, however, it found that the organization was actually using only 15% of the water that it took in and that, because of onsite waste water treatment, it was actually returning 85% to surface water in better condition than it took in.

This aspect, then, was not a significant environmental aspect but an issue for the organization's public relations personnel.

Guide 66

The document known as the IAF Guidance on ISO/IEC Guide 66 is the registration auditor's guide to interpreting and auditing ISO 14001. With respect to determination of significance, the Guidance says, "it is for the organization to define the criteria by which environmental aspects and their associated impacts are identified as significant," not the registration auditor. The registration auditor's function is to determine if the procedure is sound and adhered to.

Determination of significance is a yes or no question, not a determination of relative value. It is possible, therefore, that the execution of the environmental aspects procedure will result in the determination that the organization has no significant aspects. While the organization may elect to rank its aspects from most significant to least significant, that does not necessarily mean that any rise to the level of significant impact on the environment.

Significant Aspects

In the database of 45 organizations, 43 organizations had 135 aspects that were determined to be significant. The major categories are:

- Electric energy use = 21
- Non-hazardous solid waste generation = 18
- Thermal energy use = 15
- Hazardous materials including solvents, chemicals, and ammonia use, storage, handling, transportation, and disposal = 14
- Potential for sudden, unexpected events including spills, releases, leaks, fire, explosion, and rupture = 14
- Vehicle use, transportation = 12
- Stormwater runoff = 10
- Air emissions from operations including HAPs, VOCs, odors, GHGs = 8
- Water use and wastewater treatment including collection and conservation = 9
- Natural resources and materials consumption = 5
- Land disturbance = 2
- Indoor air quality = 2
- Contractor activities =2
- Groundwater contamination = 1
- Biological nutrient removal = 1
- Medical wastes = 1

Where the impact occurs can be material to determination of significance. For example, a coal-fired power plant's air emissions can interact with the environment; these emissions are clearly environmental aspects. Whether they significantly impact the environment may depend upon where the interaction with the environment occurs. A coal-fired power plant on Maryland's Eastern Shore has emissions aspects that impact the Atlantic Ocean; whether they are significant is debatable. The same power plant located in West Virginia has emissions aspects that impact Virginia and Maryland urban areas, forests, and the Chesapeake Bay; they are more likely to be regarded as significant.

Part of the importance of establishing *significance* lies in the fact that the potentially significant environmental impacts become a focus of Objectives and Targets (§4.3.3), Competence (§4.4.2), Operational Controls (§4.4.6), and Monitoring and Measurement (§4.5.1) requirements. An organization that determines that aspects are significant because of regulation or business reputation increases the amount of work it must do in these areas.

ISO 14001 does *not* require the organization to establish objectives and targets for each significant environmental aspect. On the one hand, the absence of a requirement to set objectives and targets for all significant aspects gives organizations

Zero Significant Aspects

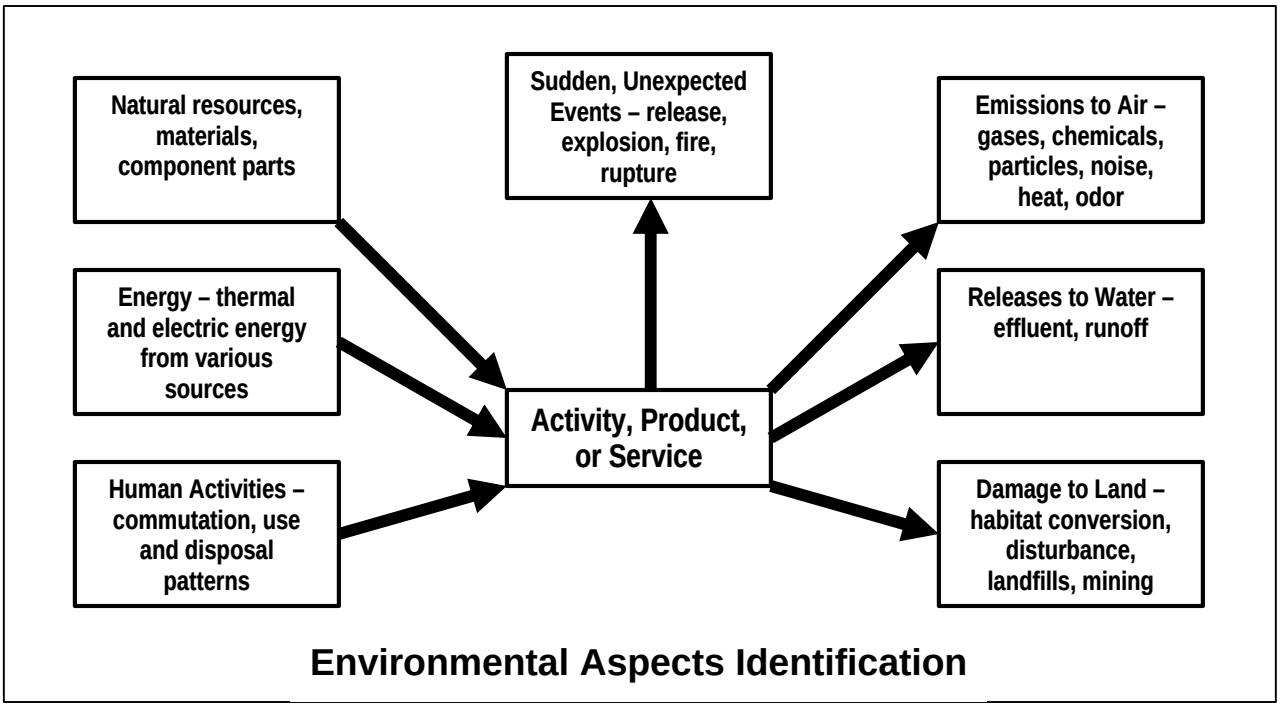
Can an organization determine that it has zero significant aspects and still conform to the requirements of ISO 14001? This question is being hotly debated in the U.S. TAG and in the registrar accreditation community.

ISO 14001 contains no language suggesting that aspects should be ranked and that the most significant of the ranked aspects should be regarded as significant. Rather, the ISO 14001 requirement is "to determine those aspects that have or can have significant impacts on the environment," a simple 'yes' or 'no' proposition.

Organizations can and do have many activities, products, and services that *can interact* with the environment but that do not have the potential to significantly *change* the environment because they are either 1) *de minimis,* 2) there are no pathways to environmental receptors for the aspect (thus, no impact), or 3) their own corrective or preventive actions have reduced the potential probability and/or severity of the impact to a level where it is not reasonably considered significant.

latitude to conform to the requirements of ISO 14001 while not presently dealing, for example, with the significant environmental aspects of products. On the other, a requirement to establish objectives and targets for all identified significant aspects could easily overwhelm an organization having many significant aspects. Without this latitude, organizations might choose to ignore the existence of significant aspects that they believe are insurmountable or even decide not to implement ISO 14001. As it is, many organizations choose to deny the existence of significant aspects about which they feel they can do nothing.

Aspect/Impact Identification – ISO 14001 does *not* prescribe methods for identifying environmental aspects and determining which can have significant environmental impacts; the procedure itself is left to the organization to devise. Establishing this procedure is, for many organizations, the most difficult part of implementing ISO 14001. What follows is a suggested way to analyze the elements of an activity, product, or service in order to identify its environmental aspects:



Environmental Aspects Identification

By considering an activity, product, or service in terms of its inputs and outputs, we can stimulate ourselves to think of the ways in which the activity, product, or service can interact with the environment. Here is the result for one organization, a manufacturer of commercial slip rings, using this method for identifying its environmental aspects:

> **Human Activities related to employment –** 700 employees; most driving alone on average 40-mile roundtrips to work (28,000 miles per day), high percentage of SUVs and pickups; lunch and breaks taken at Burger King.
>
> **Energy –** 7.8 million kWh/year coal-generated electricity; 135 thousand cu. ft. natural gas per year.

Natural Resources and Materials – Plating chemicals, solvents, paper, metals, water, packaging materials.

Sudden Events – No identified potential for sudden events.

Air Emissions – Small quantities of fugitive VOCs

Releases to Water – Runoff from approximately 10 acres of impervious rooftops and parking lots.

Damage to Land – 240 tons of solid waste per year, small quantities of hazardous waste.

Product Aspects – End product is formed metal, mostly aluminum; often recoverable following use by the customer.

Determining Significant Aspects – Once the environmental aspects have been identified, the organization must determine which, if any, have or can have a significant impact on the environment. A suggested way of doing this would be to develop a matrix with the seven elements of the environment on the horizontal axis and the identified environmental aspects on the vertical axis. An additional column on the horizontal axis would be for determining significance. Following is how the slip ring manufacturer's aspects would look on such a matrix:

Environmental Aspects	Air	Water	Land	NR	Flora	Fauna	Humans	N/S
Employee Commute	X			X			X	N
Employee Food Consumption			X			X	X	N
Electricity Use	X	X		X	X	X	X	S
Natural Gas Use	X			X				N
Natural Resources/Materials								--
Chemicals		X	X		X	X	X	S
Solvents	X						X	N
Acids		X					X	N
Paper				X	X			N
Metals				X				N
Water				X				N
Packaging				X	X			N
Sudden Events Potential	X	X	X	X	X	X	X	N
Fugitive VOCs	X						X	N
Stormwater Runoff		X						N
Solid Waste			X					S
Hazardous Waste		X	X			X	X	N
Product Impacts								--
Distribution	X							N
Use								N
Disposal			X					N

Determination of significance is a yes or no judgment based on the information available to and the environmental knowledge of those making the determination. Many implementation teams are troubled by the subjectivity of this determination. Some establish scoring systems intended to make the determinations less dependent on their judgments. Experience with scoring systems does not show improved judgments of determination except in the case where an organization with multiple facilities having much the same environmental aspects is trying to establish a uniform procedure for all facilities.

Environmental Aspects Example

As a further actual example of how organizations identify their environmental aspects, the following table is from a manufacturer of processed meats. While it is only partial, it shows how a reasonably comprehensive list of actual and potential environmental aspects can be established without a great deal of time and site evaluation.

Functional Area	Environmental Aspects
Gas Tank & Vaporizer	Loading propane; fire or explosion
	Antifreeze leak from vaporizer
Wells	Contaminates into wells
	Distribution pipe leakage; excess consumption
	Excess usage; aquifer depletion
Corn Syrup Tank	Overflow leading to spill
Maintenance Shop	Use of chemicals; potential for misuse and environmental impact
	Storage of paint; potential for improper storage
	Welding operations leading to excessive smoke and/or fire
	Potential release of oil, grease, solvents leading to vapors and/or spills
	Mishandling of used oil; potential for spill
	Disposal of waste/scrap; excess to landfill
	Poor housekeeping; unsafe conditions; injury to humans
Spice Storage	Release of chemicals during maintenance
	Release of spices and/or additives to drains
Caustic Room	Release of caustics during delivery/distribution
	Release of caustic fumes to the atmosphere
Oven	Excessive noise from boilers and steam
	Release of heat and smoke into the environment
	Buildup of tar leading to fire potential
	Gas train failure/release; fire, explosion
	Release of liquid smoke to drains
	Release of sanitizer & nitrates to drains
Raw Processing	Meat/spice/perisol release to drain
	Hydraulic oil released to drains
	Excessive water use
	Ammonia leaks
	Release of chemicals/lubricants from maintenance
Packout and Tree Cooler	Release of salt/citric acid to drains
	Ammonia leaks
	Release of maintenance chemicals to drains
	Release of product to drains
	Excessive use of film/sleeves; excess solid waste to landfill
	Excessive water use
Casing Hopper and Trash Compactor	Hydraulic oil leaks

	Casings released to drains
	Excessive noise from blowers
	Release of chemicals/lubricants during maintenance
	Excessive casing waste to landfill
New Engine Room	Potential for ammonia leaks
	Oil leaks from vacuum pumps to drains
	Chemicals to drains
	Noise from engine room to environment
	Cooling tower treatment chemicals; spill to drains
	Storage of oil; spill to drains
Cooling Tower	Cooling water dumping to ditch
	Release of water vapor to atmosphere
	Excessive noise from fans
Hydraulic Banks	Oil spill to the environment
	Excessive noise from pumps
	Fire from misting oil leak
Slurry Building	Excessive noise from blower
	Oil leak from blower; release to environment
	Release of biological waste from slurry
MDM	Release of meat/salt/nitrates to drains
	Excessive water use
	Ammonia leaks
	Hydraulic oil leak to drains
	Chemicals and lubricants to drains during maintenance
	Excessive solid waste from cardboard boxes
	Noise during operation
Combi Area	Solid waste from discarded boxes/film
	Cardboard dust from boxes
	Oil leaks from gearboxes
	Ammonia leaks
	Excessive use of shrink wrap
Old Engine Room	Ammonia leaks to environment and drains
	Oil leaks from vacuum pumps to drains
	Chemicals to drains
	Noise from engine room to environment
	Oil spill from storage to drains
Boiler Room	Noise from boilers
	Excessive heat emissions from boilers
	Combustion in the stack
	Excessive use of water
	Excessive use of high pressure water
	Excessive use of gas from boiler inefficiency

This list of aspects gives an idea of how an organization can go through each area and identify its aspects. This list (when completed) produced three significant aspects: 1) ammonia system integrity, 2) propane gas system integrity, and 3) potential for oil spills.

Environmental Aspects Worksheet

The following questions are intended to help the organization identify its environmental aspects and determine which have or can have a significant impact on the environment.

Environmental Aspects Identification

Identify the principal activities, products, and services (grouped here for convenience by relevant function and level), for example:

Relevant Functions, Level One

Production

Activities: _____
Products: _____
Services: _____
Planned or new developments: _____
New or modified activities, products, and services: _____

Maintenance

Activities: _____
Products: _____
Services: _____
Planned or new developments: _____
New or modified activities, products, and services: _____

Waste Management

Activities: _____
Products: _____
Services: _____
Planned or new developments: _____
New or modified activities, products, and services: _____

Shipping/Receiving/Warehousing

Activities: _____
Products: _____
Services: _____
Planned or new developments: _____
New or modified activities, products, and services: _____

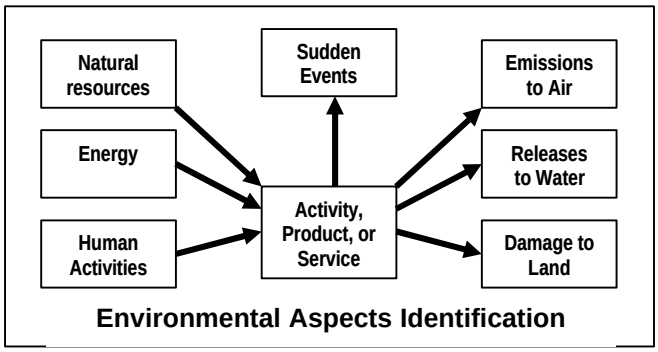
Research and Development

Activities: _____
Products: _____
Services: _____
Planned or new developments: _____
New or modified activities, products, and services: _____

Administration Group

Activities: _____
Products: _____
Services: _____
Planned or new developments: _____
New or modified activities, products, and services: _____

From the foregoing information, analyze, using the environmental aspects identification template (adjacent), the activities, products, and services to identify the organization's environmental aspects and enter them in left-hand column of the matrix that follows:



Environmental Aspects Identification

Significant Aspects/Impacts

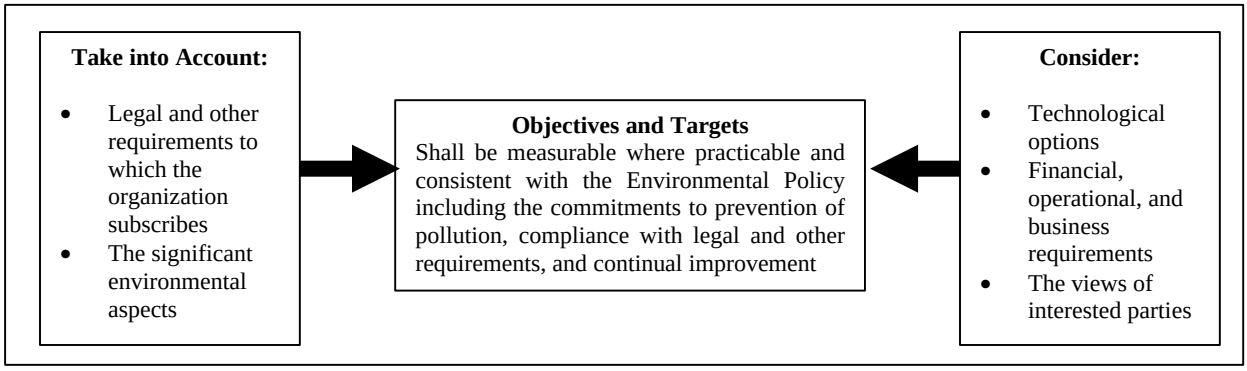
Once the aspects have been identified, determine significance by using your own valuation criteria and the matrix to determine significant *vs*. not significant:

Environmental Aspects (indicate control or influence)	Air	Water	Land	NR	Flora	Fauna	Humans	N/S

Beneficial Impacts Determination

Although it is not a requirement of ISO 14001, the organization may want to determine if any of its aspects have or can have a beneficial impact on the environment and to use that information in establishing its environmental objectives and targets. In determining whether an activity is beneficial to the environment, the Implementation Team might refer back to the South American oil refinery example (page 29). There, the original waste pit was an adverse impact. When it was remediated and returned to background conditions it became a neutral or benign aspect/impact. When management decided to create a creature habitat, it converted the benign aspect/impact to a beneficial impact.

3. Objectives, Targets, and Programs (ISO 14001:2004, §4.3.3)



ISO 14001 §4.3.3 requires organizations to set clear overall environmental goals (objectives) and detailed performance requirements (targets) at relevant functions and levels within the organization. Establishing objectives and targets is a process of taking into account legal requirements (see Section V.2 of this Handbook) and the significant environmental aspects and considering technological options, financial, operational, and business requirements, and the views of interested parties. Resulting objectives and targets must be measurable where practicable and consistent with the Environmental Policy, including the commitments to prevention of pollution, compliance with applicable legal and other requirements, and continual improvement.

As indicated in the section on Environmental Aspects, ISO 14001 does not require an organization to set objectives for its significant environmental aspects, it only requires the organization *to take* its significant environmental aspects *into account* when establishing objectives. An organization that, for example, identifies 25 environmental aspects and determines that three of them are significant, may elect to develop objectives and targets for only two of them. When organizations establish their objectives and targets, it makes sense that they consider each significant aspect individually and determine whether they want to establish an objective for it.

Environmental Objectives
Drawing from the database of 45 organizations, 40 organizations established a total of 131 environmental objectives, an average of 3.3 per organization.

Without losing sight of the requirement to establish and maintain objectives and targets at relevant functions and levels, objectives and targets can apply across the organization or be site-specific or activity-specific. An overall objective, for example, "to reduce solid waste by 20%," can be linked to specific targets for relevant functions and levels of the organization. Another overall objective of the organization might be to reduce air emissions by 50 percent within two years. This objective may translate into specific reduction targets applicable to several plants, with each target reflecting the plant's unique circumstances and environmental conditions.

The definitions of environmental objectives and targets call for quantification "where practicable." While objectives are overall environmental goals; targets, in turn, might be incremental steps to achieving the objective; *e.g.*, a detailed performance plan serving as a means to achieving the related objective. For example:

Objective 1: At all functions using chemical solvents, reduce use of chemical solvents and substitute water-soluble cleaners.
Target 1.1: Eliminate 50% of overall chemical solvent use by 12/31/05.

Objective 2: Increase use of recycled materials
Target 2.1: Achieve a 50 percent increase in the percentage of recycled material used in packaging in 2006.

Objective 3: Increase employee awareness of environmental issues.
Target 3.1: Increase the number of environmental training hours by 40 percent in 2005.

Objective 4: Reduce vehicle use impact.
Target 4.1: As vehicles come up for replacement, replace with more efficient vehicles such as hybrids.

Objectives

The 131 objectives in the database are classified as follows:

- Reduce energy consumption = 22
- Reduce solid waste generation = 20
- Improve stormwater runoff = 14
- Improve hazardous materials/wastes handling, use, storage, spills/releases, disposal = 11
- Initiate recycling/P2/green purchasing programs = 9
- Reduce facility air emissions = 8
- Reduce natural resources/materials consumption = 7
- Reduce vehicle use, emissions = 6
- Reduce freshwater consumption = 6
- Improve supplier environmental performance = 5
- Improve wastewater effluent = 4
- Ensure ammonia system integrity = 4
- Implement spill prevention and protection plans = 4
- Improve indoor air quality = 2
- Eliminate sanitary sewer overflows = 2
- Convert waste to energy = 2
- Community outreach = 2
- Ensure UST integrity = 1
- Eliminate odors = 1
- Reduce noise = 1

Target 4.2: Maintain vehicles so as to ensure maximum operating efficiency.

Target 4.3: Ensure that vehicle fits the mission; *e.g.*, don't use an SUV where a sedan will do.

The last paragraph of §4.3.3 requires that the objectives and targets be achieved through specific environmental management programs. Too often, organizations establish objectives and targets that go unrealized because the corresponding management plans and programs for achievement are vague or incomplete. §4.3.3 remedies this situation by requiring that responsibility, means, and timeframes for achievement of objectives and targets be specifically assigned at relevant functions and levels. By specifying responsibility, means (resources), and timeframes for completion, the organization eliminates vagueness and many of the reasons for not getting something done. This requirement of ISO 14001 is a simple tool for helping to ensure that what gets planned gets done. Although it is not a requirement of ISO 14001, it is also helpful to specify methods for accomplishing the objectives and targets.

An example of an environmental management program related to the objective and target for reducing chemical use cited in the preceding section might be as follows:

Target 1.1 Management Program
Responsibility – Overall: J. Jones
Production: D. Hammer

Maintenance: J. Oiler
Waste Management: D. Dempster
Shipping/Receiving/Warehousing: J. Kelly
Research and Development: L. Strong
Administration Group: S. Smith

Methods: Inventory present use of chemical solvents, identify non-toxic, non-polluting substitutes, test substitutes to determine feasibility of substitution for intended uses, do benefit/cost analyses, make recommendations to VP Manufacturing.
Means: Time budget: 240 hours. Expense budget: $2,000.
Timeframe: Complete by end of first quarter, 2006.

One final point is that individuals accepting new, time-consuming responsibilities for these programs must also be relieved of other responsibilities in order to accomplish the new. Too often, environmental management programs are just additional work piled on top of already busy personnel. Because of this overloading, it helps when considering means to establish the amount of personnel time required and whether adjustments to individual workloads need to be made.

Environmental Objectives, Targets, and Management Programs Worksheet

The following worksheet entries are intended to guide organizations in their development of objectives and targets after the significant aspects have been determined. Most organizations begin establishment of their objectives and targets from their significant aspects. Two things should be remembered at this point: 1) ISO 14001 does not *require* that objectives and targets be established for the significant aspects and 2) objectives and targets can also be established for non-significant aspects.

Determining which Aspects Should Have Environmental Objectives and Targets

List on the indicated lines all of the significant aspects and any of the non-significant aspects for which the organization may wish to establish objectives. Indicate for each consideration of how each aspect and potential objective relates to legal requirements, the significant environmental aspects, technological options, business, financial, and operational requirements, and the views of interested parties. Based on these considerations, determine whether to establish an environmental objective for the particular aspect.

Significant/Non-Significant Aspect: _____

Take into Account:

Legal Requirements: _____

Significant Environmental Aspect: Yes ___ No ___

Considerations:

Technological Options: _____

Business, Financial, and Operational Requirements: _____

_____

Views of Interested Parties: _____

_____

Establish an Objective? Yes ___ No ___

Significant/Non-Significant Aspect: _____

Take into Account:

Legal Requirements: _____

Significant Environmental Aspect: Yes ___ No ___

Considerations:

Technological Options: _____

Business, Financial, and Operational Requirements: _____

_____

Views of Interested Parties: _____
_____

Establish an Objective? Yes ___ No ___

Significant/Non-Significant Aspect: _____

Take into Account:
Legal Requirements: _____

Significant Environmental Aspect: Yes ___ No ___

Considerations:
Technological Options: _____

Business, Financial, and Operational Requirements: _____
_____

Views of Interested Parties: _____
_____

Establish an Objective? Yes ___ No ___

Significant/Non-Significant Aspect: _____

Take into Account:
Legal Requirements: _____

Significant Environmental Aspect: Yes ___ No ___

Considerations:
Technological Options: _____

Business, Financial, and Operational Requirements: _____
_____

Views of Interested Parties: _____
_____

Establish an Objective? Yes ___ No ___

Establishing Objectives and Targets and Management Programs to Achieve

For each of the aspects for which it was determined in the preceding section that an environmental objective will be established, state the environmental objective and any related targets by following the steps in this section. Be sure to state the objectives and targets in quantified terms where practicable.

Objective 1: _____
_____

Is the objective consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the objective apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the objective? (optional): _____
_____

Means for achieving the objective: _____
_____

Timeframe for Achievement? _____

Target 1.1: _____
_____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____

Timeframe for Achievement? _____

Target 1.2: _____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____

Persons Responsible at relevant levels and functions? _____

Methods for achieving the target? (optional): _____

Means for achieving the target: _____

Timeframe for Achievement? _____

Objective 2: _____

Is the objective consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the objective apply? _____

Persons Responsible at relevant levels and functions? _____

Methods for achieving the objective? (optional): _____

Means for achieving the objective: _____

Timeframe for Achievement? _____

Target 2.1: _____
_____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____
_____

Timeframe for Achievement? _____

Target 2.2: _____
_____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____
_____

Timeframe for Achievement? _____

Objective 3: _____
_____

Is the objective consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the objective apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the objective? (optional): _____
_____

Means for achieving the objective: _____
_____

Timeframe for Achievement? _____

Target 3.1: _____
_____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____
_____

Timeframe for Achievement? _____

Target 3.2: _____
_____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____
_____

Timeframe for Achievement? _____

Objective 4: _____
_____

Is the objective consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the objective apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the objective? (optional): _____
_____

Means for achieving the objective: _____
_____

Timeframe for Achievement? _____

Target 4.1: _____
_____

Is the target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____
_____

Timeframe for Achievement? _____

Target 4.2: _____
_____

Is the Target consistent with the Environmental Policy including the commitments to pollution prevention, compliance with regulations and other requirements, and continual improvement? Yes ___ No ___

To which levels and functions does the target apply? _____
_____

Persons Responsible at relevant levels and functions? _____
_____
_____

Methods for achieving the target? (optional): _____
_____

Means for achieving the target: _____
_____

Timeframe for Achievement? _____

4. Internal Audits (ISO 14001:2004, §4.5.5)

§4.5.5 of ISO 14001 requires that organizations audit the environmental management system at planned intervals to determine whether it meets the organization's plans for environmental management and the requirements of ISO 14001 and if it has been properly implemented and maintained. This requirement is to audit the EMS itself and is separate and apart from the requirement of §4.5.2, Evaluation of Compliance (see Section IV, following), to periodically evaluate compliance with environmental regulations. The EMS audit requirement is also separate and apart from the requirement of §4.6, Management Review (following section), requiring top management to review the EMS at planned intervals for suitability, adequacy, and effectiveness. The results of the internal audit are considerations for top management during the Management Review in determining the need for changes to the EMS. Finally, registration audits do not satisfy the internal audit requirement.

Auditors
- Persons with the competence to conduct an audit
- Objective
- Impartial

Internal Audit
Systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled.

§4.5.5 specifies that the organization's audit program shall take into consideration the environmental importance of the operations concerned and the results of previous audits. The requirement is not that every element of ISO 14001 needs to be audited with each audit but that whether an activity is audited should depend on its importance and the results of previous audits. Many organizations establish a procedure for annual EMS audits covering all of the elements of ISO 14001. Others establish a procedure for auditing 3-4 procedures per quarter so that all procedures are audited annually. When implementing ISO 14001 for the first time, and planning to register, organizations often have two or three EMS audits conducted so as to increase the probability that they have not missed anything in the implementation. These organizations are attempting to avoid identification of nonconformities by a registration auditor.

Audit Procedures
Shall address:
- Responsibilities for planning and conducting audits
- Reporting results to management
- Retaining audit records
- Audit criteria, scope, frequency, and methods

§4.5.5 prescribes that audit procedures shall cover responsibilities and requirements for conducting audits and reporting results and audit criteria, scope, frequency and method. It does not require that external auditors conduct audits or that specific audit guidelines be employed.

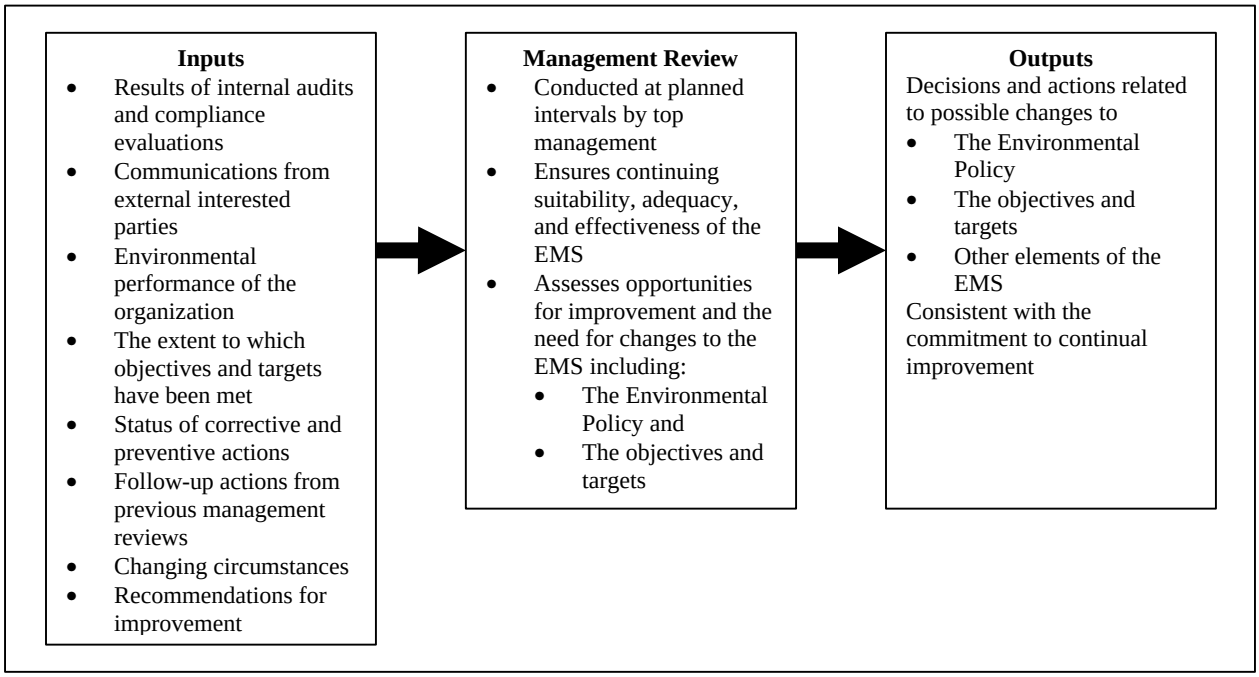
Internal Audit Variations
In the 45-organization database, 38 organizations planned to do EMS audits as follows:

- Annual audit by competent EMS auditors, either internal or external = 21
- Audit by competent internal EMS auditors on a schedule spreading the audit across the year = 10
- Annual audit conducted by corporate headquarters staff = 4
- Annual cross-audit with a sister facility = 1
- Bi-annual audit by competent EMS auditors = 1
- Tri-annual audit by external professional EMS auditors = 1

Auditors and audits are conducted to ensure objectivity and impartiality. By definition (§3.1), an auditor is a person with the competence to conduct an audit and an internal audit (§3.14) is a systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively. Auditor competence has emerged as an important consideration for registration auditors. Generally, if an organization

uses its own personnel to conduct internal audits, it must be able to demonstrate that these people are competent on the basis of appropriate education, training, or experience.

5. Management Review (ISO 14001:2004, §4.6)



ISO 14001 ensures that top management carries out its responsibility for the EMS by requiring it to review the EMS for suitability, adequacy, and effectiveness at planned intervals and to make changes as necessary.

In executing the Management Review, the person(s) appointed by top management to fulfill the role of management representative(s) delivers to top management, for the purpose of review and as a basis for improvement, a report on the EMS. While ISO 14001 specifies what information needs to be reviewed in order to ensure continuing suitability, adequacy, and effectiveness, the following information would also be useful if presented at the Management Review:

- The effectiveness of the EMS in accomplishing the goals for an EMS;
- The adequacy of roles, responsibilities, authorities, and procedures to accomplish the objectives of the EMS;
- The adequacy of human, financial, and technical resources and infrastructure to accomplish the implementation and maintenance of the EMS;
- The results of monitoring and measuring of activities and operations associated with the significant environmental aspects;
- Status of training objectives established by the EMS Implementation Team;
- The extent to which prevention of pollution techniques have been used in reducing potential adverse environmental impacts; and
- The extent to which the EMS has been improved during the current execution cycle.

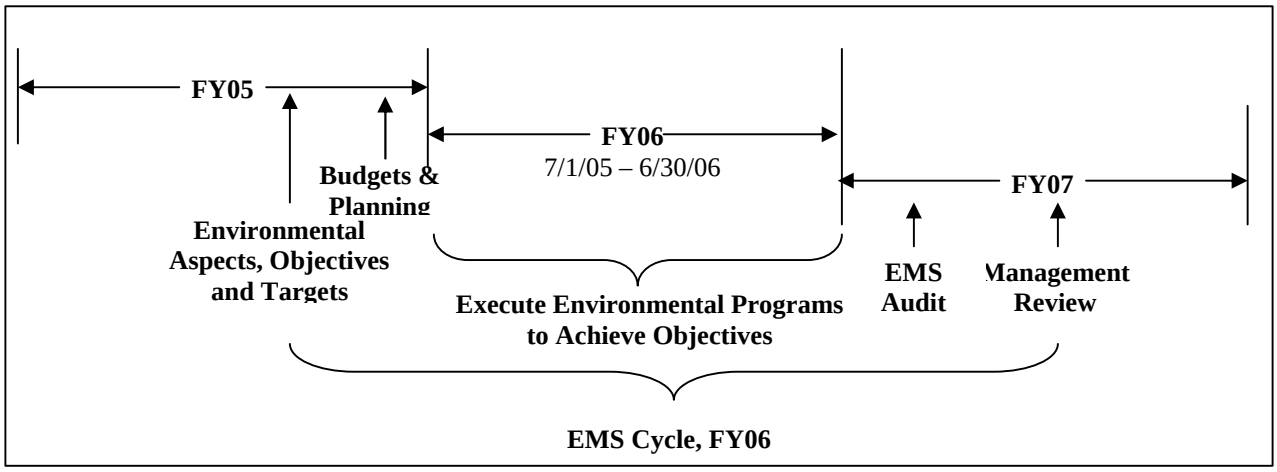
The Management Review is the opportunity to present not only the results of the EMS but also the opportunity to discuss the need for changes, particularly those changes that will help the organization meet its commitment to continual improvement of the EMS.

While most organizations conduct the Management Review at the conclusion of the year and after performance results are in, some organizations elect to review a portion of the EMS each month or quarter at scheduled management meetings. Either way satisfies the ISO 14001 requirement.

6. Integration with other Management Systems

ISO 14001 does not address the interaction of the EMS with the organization's planning and budgeting systems. Nor does it specify that the EMS operate on an annual cycle. For the success of the EMS, however, integration is an important step; experience indicates that the EMS benefits from being linked to the organization's planning and budgeting activities.

Putting the EMS on an annual cycle that coincides with the fiscal year aligns the EMS with most other business functions. An example of how this can be done is shown in this schematic:



This schematic indicates the following about an integrated EMS:

1. The EMS cycle, when based on the organization's fiscal year, will vary in length depending largely upon the timing of the organization's planning and budgeting cycle. The schematic shows a point of approximately 60 days before the beginning of the fiscal year when plans and budgets are submitted.

2. The first activity of the EMS cycle (assuming that the Environmental Policy is established) will be the identification of aspects, determination of significance, establishment of objectives and targets, and establishment of management programs to achieve the objective and targets. The information thus developed would be input for the planning and budgeting process.

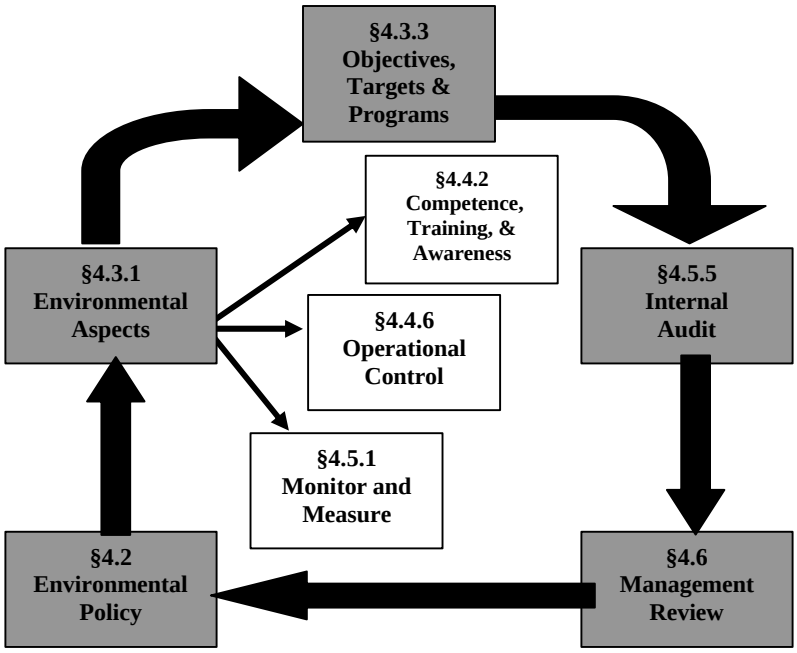
3. During the subject fiscal year, the environmental management programs established to achieve the objectives and targets will be executed. Some objectives will take more than one year to execute and they will become the subject of multi-year planning efforts.

4. Following the completion of the fiscal year, the organization will audit the EMS. Although there is not a requirement to do so, nonconformities from the internal audit are often corrected before the Management Review.

5. The results of the EMS audit and other information will be provided to management for the Management Review. The Management Review will be the final activity of the EMS cycle. Any changes directed by top management should be introduced into the next EMS cycle.

IV. Elements of ISO 14001 Triggered by the Significant Environmental Aspects

Three sections of ISO 14001 – §4.4.2, Competence, Training, and Awareness; §4.4.6, Operational Control; and §4.5.1, Monitoring and Measurement – are grouped together in this section of the Handbook because of what they have in common – their primary requirements are triggered by the organization's determination of significant environmental aspects. Although we learned in the previous section that it is *not* a requirement to establish objectives and targets for significant aspects (see III.3, page 38, second paragraph), we learn now that it *is* a requirement to ensure competence, establish documented operational controls, and monitor and measure in conjunction with the identified significant aspects.



1. Competence, Training, and Awareness, ISO 14001:2004, §4.4.2

There are three requirements contained in §4.4.2. In abridged form, they are:

1. That persons performing tasks for *or on behalf of* the organization[3] that can cause (a) significant environmental impact(s) be *competent* on the basis of education, training, or experience;

[3] **"for or on behalf of the organization" –** ISO 14001:2004 refers to "for or on behalf of the organization" in 1) the environmental policy requirement to "communicate to all persons working for or on behalf of the organization" (§4.2.f) and in 2) the §4.4.2 requirements to "ensure that any person(s) performing tasks for [the organization] or on its behalf that can cause a significant environmental impact are competent" and 3) to "establish and maintain a procedure(s) to make persons working for it or on its behalf aware" of the Environmental Policy and the EMS. There is no definition, however, of what is meant by "on behalf of".

Annex A, §A.2, Environmental Policy, second paragraph, offers guidance flawed that is flawed in the sense that if the organization followed the Annex it would not satisfy the requirement of the Specification:

2. That persons working for the organization or on its behalf shall be aware of the Environmental Policy and the EMS, the environmental aspects associated with their work, their roles and responsibilities within the EMS, and the consequences of departing from specified procedures; and

3. That the organization identify its environmental training needs and provide training to meet these needs.

Significant Impact Competence – The requirement for competence of persons whose work can cause a significant environmental impact as stated in §4.4.2 requires that:

- The organization ensure the competence of persons performing tasks that have the potential to cause a significant environmental impact;
- The persons to be competent are those performing significant impact-related tasks for (employees) or on behalf of the organization (agents, contractors, suppliers, transporters, component manufacturers, sole distributors, etc.) as determined by the organization (the population of persons required to be competent may vary by task);
- The subject significant environmental impacts are those determined by the organization to be significant;

"The environmental policy should be communicated to all persons who work for, or on behalf of the organization, including contractors working at an organization's facility. Communication to contractors can be in alternative forms to the policy statement itself, such as rules, directives and procedures, and may therefore only include pertinent sections of the policy."

This guidance is flawed because there is no suggestion in the environmental policy requirement that something less than communication of the whole policy to persons working on behalf of the organization would satisfy the requirement. While alternative forms might be acceptable in satisfaction of the communication requirement, communicating less than the whole policy would seem not to conform to the requirement.

Annex A, §A.4.2, Competence, Training, and Awareness, fourth paragraph, offers the advice that:

"The organization should require that contractors working on its behalf are able to demonstrate that their employees have the requisite competence and/or appropriate training."

This guidance, likewise, is flawed because it suggests that "appropriate training" is an acceptable tradeoff for requisite competence. The language of the standard is clear that competence "on the basis of" training, education or experience is the requirement. Validation of training, education, or experience is implied by the requirement as a requirement but not by the Annex. Validation of training through testing, supervisor observation, or some other means is essential to establishing competence; training without validation is meaningless.

These guidances from the Annex are examples of why we cannot look to Annex A for authority on the requirements.

§4.1, General Requirements, first paragraph, says, "The organization shall… determine how it will fulfill these requirements." Thus, the determination of which population of agents, contractors, and suppliers constitutes working "on behalf of" is up to the organization to determine so long as the organization's determination reasonably achieves complete communication and reasonably ensures competence.

- Competence be determined on the basis of appropriate education, training, or experience (to be appropriate, it would seem axiomatic that education, training, or experience include validation); and
- The organization must retain records associated with ensuring competence.

The steps to conform to this requirement are to:

1. Identify persons performing tasks that relate to each of the potentially significant environmental impacts;
2. Define competence as it relates to these tasks and to the potentially significant environmental impacts;
3. Evaluate whether individuals are competent based on appropriate training, education, or experience;
4. Determine what remedial training is necessary for those determined not to be competent;
5. Provide the indicated training to those persons; and
6. Evaluate to ensure that, following training, these persons are competent to carryout the potentially significant environmental impact tasks.

Significant Impact Training Examples

- An aerospace manufacturer that had determined that electric power use is a significant aspect prepared an interactive training course on behavioral aspects of power use for presentation to all employees on its Intranet. The course included a test for validating what employees had learned.
- Roanoke County, VA determined that vehicle use is a significant aspect. The County had already established a defensive driving course that was mandatory for all employees operating County vehicles. They added to this course driving tips for reducing the environmental impacts of vehicle use.
- Roanoke County also determined that paper use is a significant aspect and that almost all employees contributed to the impact. The County's Environmental Training Subcommittee determined to train all employees on a variety of methods for reducing paper use. Methods included stopping subscriptions to catalogues that were not used, double-sided copying, recycling used paper, and discouraging printing of e-mails.
- A weapons system manufacturer determined that waste going to landfill was a significant aspect. Two targets were recycling aluminum cans, plastic, and glass and double-sided use of paper. In addition to providing recycling containers and reprogramming printers and copiers, this organization also trained all of their personnel in proper recycling and double-sided printing and copying.

Awareness -- The Competence, Training, and Awareness section of ISO 14001 requires establishment, implementation, and maintenance of a procedure to make all persons working for or on behalf of the organization *aware* of:

1. The importance of complying with the environmental policy, procedures, and EMS requirements;
2. The significant environmental aspects and the related actual or potential environmental impacts associated with their work activities and the benefits of improved personal performance;

How Organizations Provide Environmental Awareness

Of the 45 database organizations, 37 planned to provide environmental awareness as follows:
Top management meeting and discussion with employees = 3
Management representative presentation to employees = 25
Train-the-trainer = 4
Video tape presentation = 1
Employee volunteer presentation = 1
Consultant presentation = 3

3. Their roles and responsibilities in achieving conformance with the requirements of the EMS; and

4. The potential consequences of departing from specified procedures.

This training requirement can be met through generalized environmental awareness training provided to all persons working for or on behalf of the organization. It cannot, however, be entirely met with an off-the-shelf training video on ISO 14001 because the requirement is too specific to the organization's environmental policy, significant aspects, employee roles and responsibilities, and to the consequences of nonconformance.

Training Needs – The third training requirement of ISO 14001:2004 is to 1) identify training needs associated with the environmental aspects and the EMS, 2) provide training or take other action to meet these needs, and 3) keep records of the process. This requirement can be met by:

1. Identifying the training needs associated with the environmental aspects and the EMS such as:

    - Energy use training where energy consumption is an identified aspect;
    - EMS lead auditor training for the Management Representative and members of the Implementation Team; and
    - Internal auditor training for those individuals selected to conduct internal audits;

2. Either providing the indicated training directly as in the case of energy use training or arranging for its provision as in the case of lead auditor and internal auditor training; and

3. Keeping records of the process.

Integration with Other Training Requirements – Some of the training required under ISO 14001 may be already furnished under or readily integrated with the organization's existing regulatory training programs. For example, environmental regulations require specific training for employees handling hazardous materials. If hazardous materials handling is an identified significant environmental impact, the training necessary to meet the regulatory requirement may also satisfy the ISO 14001 need. Each organization should review its established training programs to determine if they can also fulfill ISO 14001 requirements.

For many organizations, it makes sense to establish a core curriculum of environmental training applicable to a wide range of individuals. The core curriculum could be built around potentially significant environmental impacts identified under ISO 14001 and the environmental regulations to which the organization is generally subject. Additional training modules could be developed to address specific training needs under a specific regulation or significant impact.

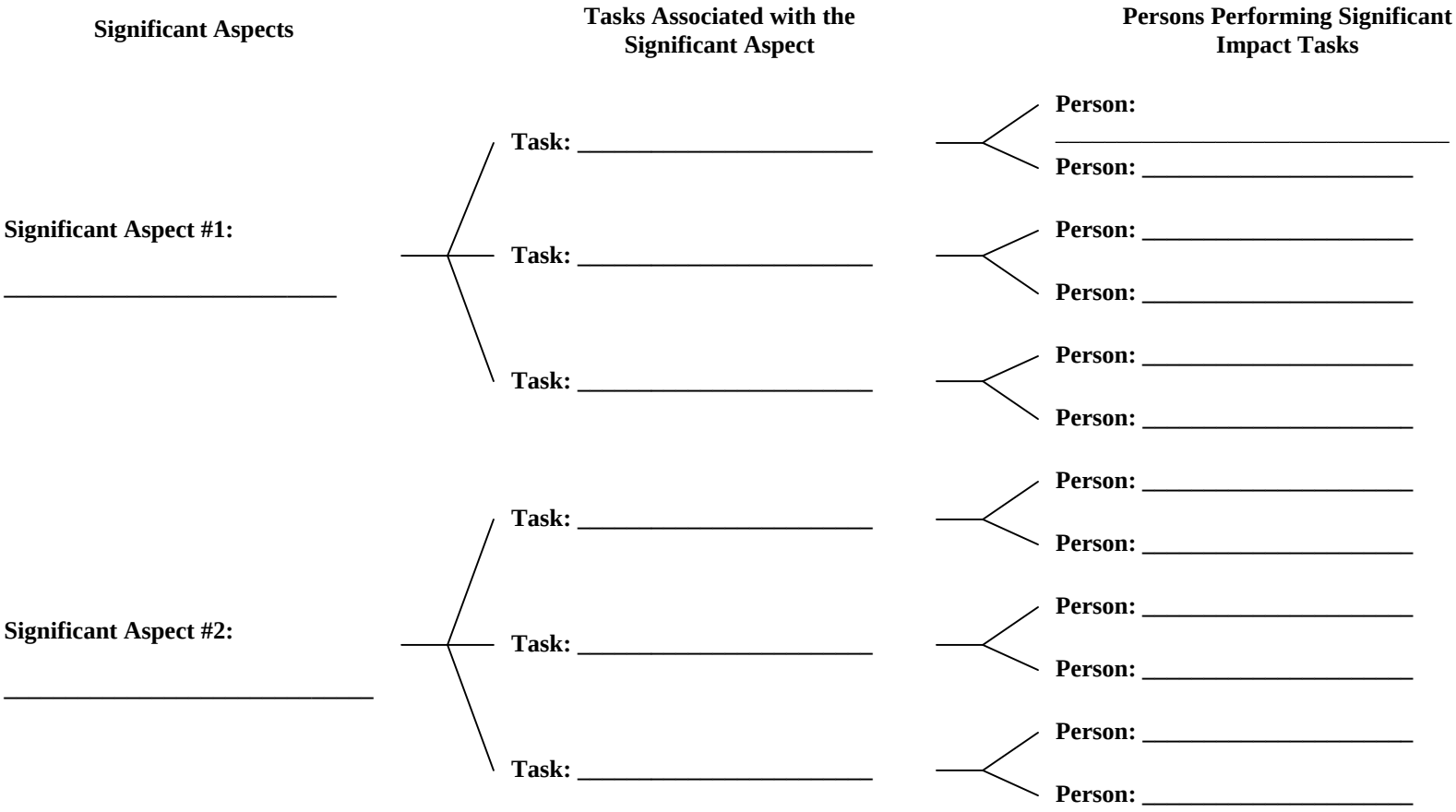
Introduction of Environmental Values to Training – As a part of continual improvement of the organization's overall training program, organizations may want, when they revise their existing training programs and training exercises, to incorporate environmental values. For example, a case study on personnel management might be structured to include reminders of

environmental stewardship so that the primary objective of the training is satisfied and a secondary objective of environmental awareness is accomplished as well. In this way, environmental awareness can be continually embedded in the organization.

Training, Communication, and Implementation of ISO 14001 -- The awareness-training requirement overlaps with the requirements of §4.4.3, Communication (see Section VI). When making plans to communicate about environmental issues, the organization should coordinate its communications efforts with its training efforts.

Most organizations provide annual environmental awareness training sessions. Other organizations do one-time environmental awareness training for all employees, build environmental awareness training into their new-employee orientation programs, and maintain environmental awareness through internal communication. Either way should satisfy the requirement of ISO 14001 for environmental awareness.

Significant Aspects Training Worksheet – Identification of Employees for Significant Aspect Training



2. Operational Control (ISO 14001:2004, §4.4.6)

Operational Controls over Significant Environmental Aspect Activities, §4.4.6.a&b – ISO 14001 requires the organization to identify and plan the operations associated with its identified significant environmental aspects in order to establish documented operational control procedures that preclude deviation from the Environmental Policy or not achieving objectives and targets.

Case Example

Roanoke County, VA determined that vehicle use is a significant environmental aspect of county operations. Roanoke identified the operations associated with vehicle use as:

- County Administration's need to travel to various County facilities.
- General Services' need to visit facilities and sites throughout the County.
- Police' need to patrol all sectors of the County and respond to accidents and emergency situations.
- Fire and Rescue's need to respond to emergencies and accidents throughout the County.
- Parks & Recreation's need to take equipment and supplies to park facilities throughout the County.

Given these vehicle use activities, it was logical for the County to establish documented procedures to:

- Minimize non-essential vehicle trips.
- Eliminate unnecessary idling of vehicles.
- Ensure that the vehicle fit the mission by, for example, not sending SUVs on trips when sedans were more practical and safer.
- Require regular vehicle maintenance to reduce vehicle emissions.
- On high ozone days, invoke emergency use only strategies.

Opportunities to apply operational controls can be found by reviewing operations. As shown in the accompanying text box, once the operations that can produce significant impacts are identified, it is a relatively simple step to establish operational control procedures that are consistent with the aims of the Environmental Policy and the objectives and targets and that stipulate operating criteria.

The following table shows actual significant aspects, their associated operations, and the operational controls that were established to avoid deviating from the organization's Environmental Policy or not achieving the objectives and targets:

Significant Aspect	Associated Operations	Operational Controls
Potential for ammonia release	Operation of a pressurized ammonia system for refrigeration	Implement and maintain a documented Process Safety Management program for the ammonia system.
Potential for oil spills	Hydraulically actuated machinery and associated sumps, reservoirs, and storage	Audit of hydraulic system, establishment of action list for leak repair with responsibilities and due dates, establishment of ongoing daily, weekly, and monthly inspections.
Solid waste generation	Receiving	Recycle cardboard into separate dumpster, post signs on all dumpsters that cardboard has a special receptacle.
Solid Waste Generation	Administration	Place notices on copiers to use the double-sided feature Issue directive against routine printing of e-mails Place separate containers for different categories of recyclable

		waste – white paper, plastic, aluminum – throughout the facility.
Significant Aspect	**Associated Operations**	**Operational Controls**
Hazardous materials storage	Production	Order minimum quantities consistent with needs
Hazardous waste storage	Production	Log quantities of hazardous wastes generated so that there is constant knowledge of total waste on hand
Delivery of hazardous materials	Receiving	Require information from carriers and transporters on driving records of delivery personnel and annual hours of driver training. Restrict deliveries of hazardous materials to pre-qualified drivers.
Electricity use	Production	To the extent possible, schedule activities that involve shutdown, such as maintenance and cleaning, for electric power peak-rate periods

Significant Environmental Aspects of Goods and Services, §4.4.6.c – This requirement of ISO 14001 requires careful reading. Here is a parsed interpretation of the Operational Control requirement as it relates to goods and services furnished by others:

"The organization shall identify those operations that are associated with [its] identified significant environmental aspects… The organization shall plan these operations in order to ensure that they are carried out under specified conditions by… [1] establishing and maintaining procedures related to the identifiable significant environmental aspects of goods and services used by the organization and [2] communicating relevant procedures and requirements to suppliers and contractors."

An easy way to conform to this requirement is to:

1. Identify the operations associated with the significant environmental aspects;
2. Identify the environmental aspects of goods and services furnished by others;
3. Determine how these aspects contribute to the organization's significant aspect operations;
4. Establish appropriate/relevant requirements for the providers of these services; and
5. Communicate the requirements to suppliers and contractors.

Confusion in conforming to this requirement can arise because it is easy to read sub-clause c) independently of the first sentence of §4.4.6.

Case Example

Perdue Farms at its chicken production plant in Showell, MD determined that one of its significant environmental aspects is the potential for stormwater runoff containing biological sediments. One of the activities associated with this aspect was the parking of trucks (owned by Perdue and others) that contained or had recently contained live birds being delivered to the plant.

Perdue had carefully ensured that the parking lot drained directly to the onsite wastewater treatment facility so that it captured any of the biological sediment coming from parked trucks.

Occasionally, supplier's trucks were parked off the pavement on the grass and the grass either infiltrated stormwater to groundwater or drained directly to surface waters. These trucks, then, were contributing to the environmental impact that Perdue was trying to manage.

The procedural control relating to this significant aspect of suppliers' delivery was to mandate that no vehicles be parked on the grass.

This first sentence gives context to the rest of the section in that it requires that we first "identify those operations… associated with the identified significant environmental aspects." Once we have identified these operations, we look to the significant aspects of goods and services supplied by others and assess their contribution to the potential environmental impact. The accompanying example is offered to help clarify the intent of the requirement.

3. Monitoring and Measurement, ISO 14001:2004, §4.5.1

The Monitoring and Measurement section contains two requirements:

1) Measurement and monitoring of environmental performance associated with operations that *can* have a significant impact on the environment; and

2) Calibration and maintenance of equipment used for environmental monitoring and measurement.

Monitoring and Measuring of Performance -- This section calls for a "procedure to monitor and measure… key characteristics of… operations that can have a significant impact on the environment."

Note that the section does not specifically require the organization to monitor and measure the significant environmental impacts of its products or services. As a practical matter, however, organizations should establish measurements over all environmental aspects that they determine are significant irrespective of whether the impacts relate to an activity, product, or service.

This section also requires the documentation "of information to monitor performance, applicable operational controls, and… environmental objectives and targets." §4.6, Management Review, requires that environmental performance and achievement of objectives and targets become inputs into the Management Review (sub-sections c & d).

Measurement Examples

From some of the 45 organizations in the database come these examples of what to measure:

- **Energy use –** gas and electricity consumption adjusted for degree-days and indexed to square feet of exposure.
- **Electricity use –** aggregate kWh indexed to units of production; kWh per building when separately metered.
- **Hazardous materials –** inventory of hazardous materials and reasons for their use.
- **Solid waste –** pounds of solid waste generated as determined by waste haulers' scale or periodic sampling.
- **Stormwater runoff –** determination of ratio of impervious area to total area at a facility; determination of annual runoff volume; qualitative evaluation of runoff content.
- **Vehicle use –** mileage as determined from odometer records, vehicle use surveys, or gross estimates.
- **Air emissions –** lbs/tons of emissions as developed for emissions reporting requirements.
- **Water use –** aggregate water use indexed to units of production.

Calibration and Maintenance -- The requirement of having a calibration system is to ensure that measurements are reliable and accurate. A calibration system may be developed following these steps:

- Identification of measurements to be made;
- Identification of equipment, instruments, hardware and software to be used;

- Identification of the testing methods to be used;
- Determination of the accuracy and precision required or desired;
- Definition of calibration procedures;
- Use of the system;
- Establishment of records;
- If equipment is found to be out of calibration, corrective action; and
- Improvement of the system as necessary.

Summary on Competence, Operational Controls, and Monitoring and Measurement Requirements

Determining how to satisfy these three requirements of ISO 14001 can be done in an exercise conducted by a cross-functional team that takes each potentially significant impact and then determines 1) what is necessary to measure the impact, 2) what operational controls can be applied, and 3) what training is necessary. Oftentimes, it is difficult to identify specific measurements, operational controls, or training needs associated with a significant impact. The exercise, however, helps the organization to define what it means by grading the impact as significant.

For example, an organization might determine that consumption of materials constitutes a significant environmental impact. But measuring materials consumption, identifying operational controls, and training personnel in ways to use materials more efficiently might prove to be very difficult. The organization might decide to focus on a select group of materials that can be measured, controlled, and will respond to training. In doing the exercise like this, the organization may not establish overall measurements, controls, and training over the significant impact but it will have made progress on an incremental portion of the impact.

Worksheet Example on Operational Controls and Monitoring and Measurement

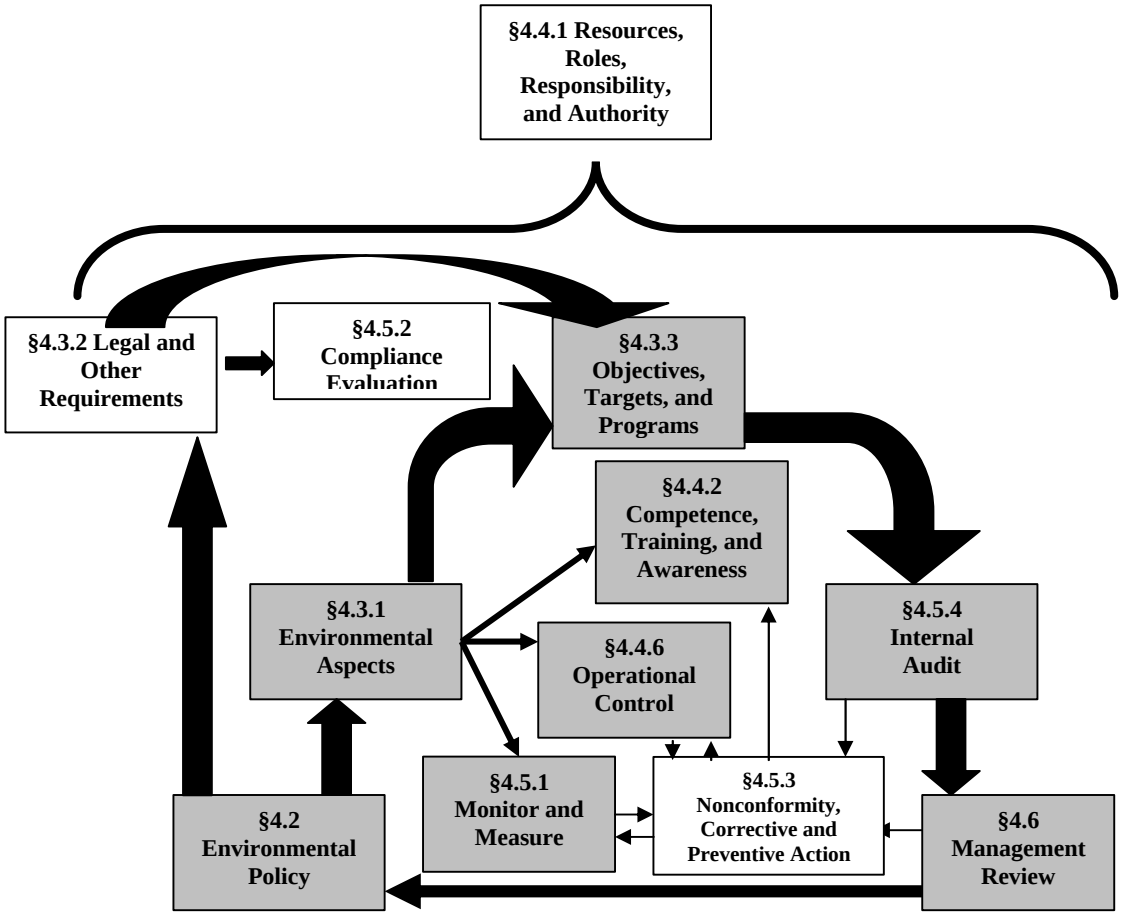
Establishing operational controls and measurements lend themselves to concurrent implementation. Completing a table like the following may be a helpful way to establish both operational control and monitoring and measurement procedures:

Significant Aspect	Associated Operations	Operational Controls	Key Characteristics of Operations	Measurements
1. Electric power use	Production	Operating procedures that optimize power use	KWh use, supplied by coal-fired generator	KWh/production unit
	Facility heating/cooling	Operating procedures to maintain temperature at predetermined levels	Combined thermal/electric energy use	Energy units/degree day
	Office equipment and lighting	Management directive on electric energy efficiency	KWh use	KWh/month
2. Solid waste	Administration	Management directive on efficient use of paper	Paper use	Paper use/employee
	Cafeteria	Operational procedure to separate recyclable and compostable waste	Food waste	Kitchen waste/diner
	Shipping/receiving	Operating controls to minimize, reuse, and recycle packaging materials	Packaging materials	Lbs. Corrugated/month # 0f pallets
3. Hazardous materials	Production	Operational procedures aimed at minimizing VOCs	Cleaning solvent use	Gallons solvent/year
	Janitorial	Operational procedures to control the number and type of toxic cleaning supplies used	Cleaning supplies	# of toxic cleaning supplies
	Grounds	Maintenance contract to limit the amount of fertilizers and pesticides used	Fertilizer, pesticide use	Lbs. fertilizer, pesticide
4. Stormwater runoff	Parking lot	Operational procedures to limit use by excessively leaking vehicles	Runoff containing hydrocarbons	Runoff quality
	Roof	Operational controls may not be feasible; corrective action to route runoff to groundwater may be only remedy	Runoff not directed to groundwater	Runoff volume

Significant Aspect	Associated Operations	Operational Controls	Key Characteristics of Operations	Measurements
5. Sudden events potential	Pipeline	Process safety management directive	10-mile pipeline network, 20 pumping stations	Process safety tasks
	Tank farm	Process safety management directive	150-tank storage facility	Inspections/month
	Vehicle operations	Vehicle inspection and maintenance procedures	200-tanker fleet	Accidents/100K miles
6. Air emissions	Painting	Operational controls to minimize use of paints containing HAPs	Paints containing toxic chemicals	Lbs./year
	Painting	Controls on VOC emissions	Paints containing ozone-forming chemicals	Lbs./month

V. Key Elements of ISO 14001

The Resources, Roles, Responsibility, and Authority; Legal and Other Requirements; Evaluation of Compliance; and Nonconformity, Corrective Action and Preventive Action elements of ISO 14001 are all essential to the ongoing effectiveness of the EMS. This section describes how they function within the overall scheme.



1. Resources, Roles, Responsibility, and Authority (ISO 14001:2004, §4.4.1)

§4.4.1 of ISO 14001 establishes three important requirements:

1. That management *ensure the availability* of resources to establish, implement, maintain, and improve the EMS;

2. That roles, responsibilities, and authorities be defined, documented, and communicated in order to facilitate effective environmental management; and

3. That top management appoint a management representative(s) who, irrespective of other responsibilities, will have responsibility and authority for implementing and maintaining the EMS and for reporting to top management on the performance of the EMS.

Ensuring Availability of Resources – Provision of resources for the EMS is almost always an issue within organizations. Although top management usually understands and accepts, at least in principle, the requirement to provide resources, the level of management that makes decisions on capital deployment and operating budgets often does not subscribe to the same requirement. Making the case for resources typically requires the implementation team or management representative to quantify intangibles such as the avoided cost of regulatory fines or the value to the environment of reducing environmental impacts.

Fact of Life
Implementation teams and management representatives have to be adept at selling their needs for resources to planning and budgeting decision makers irrespective of top management's more generous commitments to the EMS expressed in the Environmental Policy.

When considering the requirement to provide resources, especially financial resources, it may be important to recognize that ISO 14001 requires the provision of resources for the establishment, implementation, maintenance, and improvement of the EMS, not necessarily resources to correct or prevent environmental impacts or to register to ISO 14001. When contemplating the cost of implementing ISO 14001, organizations, again, should think in terms of three separate cost categories:

1) Internal labor and external consultant costs to establish, implement, maintain, and improve the policy and procedural elements of ISO 14001;

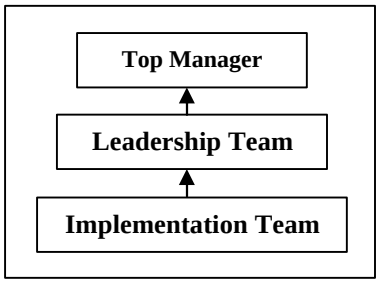
2) Capital costs for correction or prevention of environmental impacts; and

3) Costs of registration to ISO 14001, if the organization elects to register.

Roles, Responsibilities, and Authorities – In the past, some organizations have employed a practice of *not* delegating responsibility and authority for environmental affairs to *specific* management representatives, reasoning that if the responsibility was diffused throughout the organization, no one person could become personally accountable for non-compliance with regulations or for environmental liabilities. §4.4.1 of ISO 14001 limits such 'willful ignorance' by requiring top management of the organization to appoint "specific management representative(s)" to ensure that the EMS is implemented and that top management be apprised of EMS performance. It also requires that the delegation of responsibility and authority be documented and communicated, thus eliminating circumstances where responsibility and authority for the EMS are diffuse or uncertain.

When §4.4.1 is read together with the requirement of the Environmental Policy for a commitment to comply with applicable legal requirements, §4.3.2, Legal and Other Requirements, requiring a procedure for identifying legal requirements (following), and §4.5.2, Evaluation of Compliance, requiring a procedure for evaluating regulatory compliance, it is evident that the management representative is also responsible for ensuring that the organization is in compliance with applicable regulations. While this responsibility and authority can be delegated, the chain of delegation begins with top management and is passed to the management representative, effectively eliminating any uncertainty as to who is responsible and authorized to ensure regulatory compliance.

EMS Organizational Structure – There is an almost universal norm for the management structure of the EMS organization under ISO 14001. It begins with the top management position, proceeds to the top manager's leadership team, and then to an EMS implementation team that is generally chaired by the management representative. The departments making up the relevant functions and levels of the organization and environmental, safety, and health professionals comprise the typical implementation team.



Defining Roles, Responsibilities, and Authorities for the EMS – In defining, documenting, and communicating EMS roles, responsibilities, and authorities, it makes sense to begin with top management and proceed through all of the positions having EMS responsibilities. Following is a generic example of how roles, responsibilities, and authorities might be documented and communicated in an EMS Procedures Manual:

Plant Manager

Authority: The Plant Manager has the authority, responsibility, and accountability for managing all aspects of ABC Company's activities, products, and services at the Anytown facility.
Source: Senior Vice President, Manufacturing, ABC Company, Inc.
EMS Responsibilities: Under the requirements of ISO 14001, the Plant Manager shall be specifically responsible for:

1) Defining the Environmental Policy;
2) Delegating authority and responsibility for the establishment, implementation, maintenance, and improvement of the EMS;
3) Providing human, technological, infrastructure, and financial resources and specialized skills; and
4) Periodically reviewing the EMS for suitability, adequacy, and effectiveness and directing changes as necessary to achieve the goals for an EMS and the commitment to continual improvement.

Leadership Team

EMS Responsibilities: The Leadership Team shall advise the Plant Manager on the exercise by the Plant Manager of his/her responsibilities for the EMS.

Management Representative, Implementation and Maintenance Responsibilities

EMS Authority: The Plant Manager delegates to the Manager, _____ _____, the authority to establish, implement, maintain, and improve the Environmental Management System and to ensure that it conforms to the requirements of ISO 14001. In the context of ISO 14001, the Manager, _____ _____, shall be the Management Representative.
EMS Responsibilities:

1) Implementing and maintaining the EMS;
2) Ensuring that the EMS conforms to the requirements of ISO 14001;

3) Chairing the ISO 14001 Implementation Team;
4) Scheduling meetings of the ISO 14001 Implementation Team to execute the EMS procedures that are its responsibility;
5) Monitoring and recording information to track progress in the achievement of objectives and targets; and
6) Such other tasks as are described within this EMS Procedures Manual or as are directed by the Plant Manager.

ISO 14001 Implementation Team

EMS Authority: The Plant Manager delegates to the ISO 14001 Implementation Team the authority necessary to carryout its enumerated responsibilities.

EMS Responsibilities: The Plant Manager delegates responsibility to the ISO 14001 Implementation Committee for:

1) Identifying and inventorying the environmental aspects;
2) Determining which aspects are significant;
3) Establishing provisional environmental objectives and targets;
4) Developing provisional environmental management programs for the achievement of the objectives and targets;
5) Submitting the objectives and targets and the environmental management programs to the Leadership Team for review and approval;
6) In conjunction with the significant aspects, carrying out the associated competence, operational control, and monitoring and measuring requirements;
7) Assisting the Management Representative in the establishment, implementation, maintenance, and improvement of the EMS; and
8) Such other EMS tasks as it may be directed to undertake from time to time by the Plant Manager.

Green Teams

Some organizations establish Green Teams separate and apart from the ISO 14001 Implementation Team that are expressly responsible for identifying and implementing cost-beneficial pollution prevention projects and community outreach projects. Following is a draft charter for such a Green Team:

Green Team Mission

To identify and implement environmental projects that are cost-effective, achieve material reductions in pollution, and contribute to the overall efficiency of operations or that achieve community outreach objectives

.

Green Team Charter

The Green Team has been established and members appointed under the authority of ABC Company's Anytown Plant Manager.

In addition to their other responsibilities, Green Team members accept responsibility for:

- Identifying potential pollution prevention projects that can be implemented cost-effectively (as measured by achieving an internal rate of return equal to or greater than ABC Company's expected rate of return for no-risk investments), that achieve material, measurable reductions in pollution, and that contribute to the overall efficiency and effectiveness of operations at the Anytown facility;
- Identifying potential community outreach projects that increase community awareness about the importance of preventing pollution;
- Submitting proposed projects to the Leadership Team for review, consideration, and approval; and
- Implementing projects approved by the Leadership Team.

The Green Team shall coordinate with the ISO 14001 Implementation Team so that its activities complement and do not overlap those of the Implementation Team.

Management Representative, Legal Requirements Responsibilities

Legal and Other Requirements Authority: The Plant Manager delegates and grants to the Management Representative the responsibility and authority necessary to ensure compliance with environmental laws, regulations, and 'other' requirements, including the Plant Manager's authority to compel compliance with environmental laws, regulations, and other requirements and to issue stop work orders where noncompliance with environmental laws, regulations, or other requirements could lead to injury or illness of humans or to serious damage to the environment.

Legal and Other Requirements Responsibilities: The Management Representative shall be responsible and accountable for the organization's compliance with applicable environmental laws, regulations, and other requirements.

EMS Coordinator

EMS Authority and Responsibility: The Management Representative delegates to the EMS Coordinator authority and responsibility for the following EMS activities:

1) The day-to-day administration of the EMS;
2) Providing environmental awareness orientation to new employees;
3) Monitoring legal and other requirements for new requirements or changes and alerting the Management Representative when new requirements or changes are identified;
4) Controlling EMS documents;
5) Documenting and maintaining the EMS Procedures Manual; and
6) Such other responsibilities as the Management Representative may from time-to-time assign.

Within these responsibilities is included the responsibility to communicate the Environmental Policy to all employees and to make the Environmental Policy available to members of the public.

Managers and Supervisors

EMS Responsibilities: Managers and Supervisors are directed by the Plant Manager to support the implementation and maintenance of the EMS in their designated areas of responsibility and, as necessary, to provide members to serve on the IS0 14001 Implementation Committee.

Employees

Responsibilities: Employees are directed by the Plant Manager to uphold the Environmental Policy and to support the implementation and maintenance of the EMS.

Choosing the Management Representative – Most organizations have an environmental management structure in place when they undertake ISO 14001 and the person who is at the head of that structure usually becomes the EMS Management Representative. Where the EMS Management Representative function is not pre-established, choosing the Management Representative during the course of EMS implementation (rather than before implementation) may have an advantage in that a person ideally suited to lead the EMS might emerge.

An effective Management Representative will have particular skills and capabilities, including:

- Adequate available time to carryout EMS responsibilities;
- Ability to communicate to both higher and lower levels within the organization;
- Authority equivalent to responsibility;
- Organizational skills;
- Broad knowledge of the organization; and
- Independence.

2. Legal and Other Requirements (ISO 14001:2004, §4.3.2)

§4.3.2 is established in conjunction with the Environmental Policy requirement of a "commitment to comply with applicable legal requirements and with other requirements to which the organization subscribes" and with §4.5.2's requirement to "establish, implement, and maintain a documented procedure for periodically evaluating compliance with applicable legal requirements… and with other requirements to which it subscribes." §4.3.2 requires the organization to establish, implement, and maintain a procedure for identifying and having *access* to legal requirements, not that it necessarily maintain an archive of applicable laws, regulations, and other requirements. The organization can subscribe to a service that furnishes regulations and updates, access current versions of laws and regulations electronically, or subcontract the task to someone else and conform to this requirement of ISO 14001.

§4.3.2 of ISO 14001 has been criticized for being insufficiently stringent. Critics contend that an organization can conform to the requirements of ISO 14001 without being in full compliance with applicable regulations. While this reasoning is theoretically correct, it would be difficult, if not impossible, for an organization to register its conformance with ISO 14001 and not be in substantial compliance with laws and regulations. For organizations that don't have active compliance programs when they begin implementation of ISO 14001, it is virtually impossible to continue to evade compliance responsibilities – ISO 14001 puts regulatory requirements unavoidably in front of the organization.

Regulatory Compliance and Significant Aspects
A counterpoint to the criticism that ISO 14001 is not sufficiently rigorous in its compliance requirements is that the experience of the 45 database organizations implementing ISO 14001 shows that fewer than half of these organization's significant aspects are subject to regulation. A high percentage of significant aspects have as their root the unregulated consumption of electric and thermal energy, the generation of unregulated solid wastes, vehicle use, and the attenuation of unregulated stormwater runoff.

In establishing the legal requirements procedure, the organization should be careful to include a method for identifying environmental legal requirements applicable to environmental aspects of products and services as well as to facility operations.

§4.3.2 also requires the organization to determine *how* the legal and other requirements apply to the organization's environmental aspects.

The procedure for having access to legal and other requirements should describe how the organization intends to:

- Search for and identify applicable legal and other requirements;

- Gain access to current versions of these requirements;
- Determine how they apply to the organization's environmental aspects; and
- Anticipate and respond to changes.

As a practical matter, any organization that does not yet have an active compliance program and has known regulatory exposures should consider engaging professional help to determine what their compliance responsibilities are and how they can best fulfill them. Environmental consultants and environmental attorneys are good sources for this kind of assistance as are compliance assistance programs offered by state environmental regulatory agencies.

An example of how an organization might document and fulfill the legal and other requirements procedure follows.

Table of Applicable Legal and Other Requirements

Environmental Aspect	R/NR/Other	Regulation/Other Requirement	How Applied	Compliance Status	Responsible Person
Refrigerant releases from cooling system	R	40 CFR 82	Applies to servicing, maintenance, repair, and disposal of appliances	In compliance	John Johnson
Air Emissions	R	40 CFR 70, Title V Permit	VOC emissions from equipment VOC emissions from solvents	Permit application pending	Joe Brown
Wastewater discharges	R	40 CFR 403	Ph, BOD, TSS	Permit approved	Susan Rhodes
Products containing mercury	R	EU Directive 2002/95/EC	Electronic switches containing mercury	Working toward elimination of mercury in products	Al Ferguson
Non-hazardous solid waste generation	NR		Generation of paper, plastic, and aluminum waste from all operations	NA	Melinda Andrews
Use of lead solder	Other	ABC Company contract	Contract specifies that lead solder may not be used in products manufactured for ABC	Not in compliance	Jeff Richards

3. Evaluation of Compliance (ISO 14001:2004, §4.5.2)

The requirement to establish a procedure for periodically evaluating compliance with applicable legal and other requirements falls short of specifically requiring regulatory compliance audits but, in fact, a system of regular regulatory compliance audits may be the most practical means for meeting this requirement of the standard. In the U.S., determination of whether to conduct a compliance audit will be governed in part by the particular jurisdiction's approach to allowing a legal privilege for the self-assessment audit.

Evaluation *vs.* Audit – The difference between an evaluation and audit can only be determined by looking outside of ISO 14001. Consulting a dictionary reveals that an evaluation involves a determination of value or worth and that an audit is an examination of accounts done by persons appointed for the purpose. A better definition `is the more specific ISO 19011:2002, G*uidelines for Quality and/or Environmental Management Systems Auditing,* which defines an **audit** as a "systematic, independent, and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled."

Many organizations do not have a system for evaluating regulatory compliance other than their own records and the inspections of regulatory officials. This lack of a verification system can be a risky way to operate. Reports of enforcement actions and consent agreements show that many organizations are blindsided by rogue employees who violate rules and falsify documents to cover up environmental misdeeds. Although ISO 14001 does not prescribe a specific approach to evaluation of regulatory compliance, organizations should consider methods for going beyond verification of records by collecting and evaluating physical evidence.

How organizations ensure compliance

41 of the 45 database organizations ensure compliance in the following ways:

- Active compliance program with annual audits = 12
- Active compliance program with bi-annual or tri-annual audits = 13
- Active compliance program without audits = 4
- No compliance program = 7
- Not subject to regulation = 5

4. Nonconformity, Corrective Action and Preventive Action (ISO 14001:2004, §4.5.3

The intent of §4.5.3 is that the organization put in place procedures for 1) identifying actual and potential nonconformities to EMS requirements, 2) taking appropriate corrective or preventive action, and 3) reviewing the effectiveness of corrective or preventive actions taken.

The nonconformity requirement of ISO 14001:1996 was a passive requirement in that it was only triggered when a nonconformity came to the attention of the organization through one of the other EMS procedures, such as the EMS audit or management review. ISO 14001:2004, however, requires that the organization establish and maintain procedures to identify actual or potential nonconformities, determine their causes, take action to avoid recurrence or occurrence, record results, and review effectiveness of corrective or preventive actions.

Nonconformity *vs.* Noncompliance

It is appropriate to distinguish between nonconformity and noncompliance. A nonconformity is any failure to meet a requirement of the EMS. Noncompliance is a failure to meet the requirements of a law, regulation, or other requirement. §4.3.2 deals with nonconformities.

How the organization goes about identifying actual or potential nonconformities is up to it to determine. From the standpoint of registration auditors, it would seem that they would want to see a specific procedure requiring members of the organization to conduct some kind of periodic checklist driven, walk-through inspection for nonconformities. In addition, the procedure should allow for submission of nonconformities by any member of the organization.

Actual nonconformities are usually fairly evident and relatively easy to investigate because there is a tangible occurrence with which to deal. The organization should also want to evaluate minor instances of nonconformity that, while not significant in and of themselves, if they occurred under different circumstances, could lead to a significant deviation from the EMS. Such "near misses" could be identified by the occurrence of a sudden, unexpected event, a failure to achieve an objective or target, or a deviation from the Environmental Policy.

Potential nonconformities are more difficult to identify and correct. Here, application of Failure Mode and Effects Analysis would be appropriate for organizations having that capability.

When investigating nonconformities, organizations should focus on identifying underlying *root causes*, not just the immediate manifestation of the problem. If a chemical storage drum leaks, the organization should take action, first, to mitigate the damage and, then, to determine why the leak occurred; *e.g.*, improper or negligent handling, mechanical failure, or lack of a leak detection system. Corrective or preventive actions should then focus on eliminating the cause through training, communication of procedures, use of leak-resistant drums, or installation of a leak detection system.

Other ISO 14001 sections, principally Emergency Preparedness and Response, Internal Audit, and Management Review, are tools that the organization implements in order to help identify instances of actual or potential nonconformity. The underlying principle of these sections is that the identification of nonconformities should be made by the organization through diligent application of these tools, not from the occurrence of an environmental event, a customer or community complaint, or investigation by a regulatory authority.

While §4.5.3 does not specifically mention disciplinary action, in many cases disciplinary action or the threat of disciplinary action is appropriate to prevention of future nonconformities. Many organizations have written codes of conduct that give employees notice that deviations from the codes will not be tolerated and that prescribed penalties can result for infractions. These codes can be expanded to include penalties for deviations from the EMS. If so, penalties should be commensurate with the violation itself and should acknowledge the nature of the environmental damage, the degree of negligence, prior conduct, and the forthrightness of the employee being disciplined. Any such code and its remedies should be administered fairly and consistently and should have as its objective correction and prevention of EMS nonconformities, not punishment of employees.

Finally, identification, investigation, and correction of nonconformities leads to the need to revise documented procedures.

Resources, Roles, Responsibilities, and Authorities Worksheet

1. Who is the top management person in your organization as it has been defined? _____

2. Has this person been made aware of his/her responsibilities under ISO 14001? _____

    a. Defining the Environmental Policy? ____
    b. Delegation of responsibility and authority for the EMS? ___
    c. Provision of resources for the EMS? ___
    d. Periodically reviewing the EMS for suitability, adequacy, and effectiveness? ___

3. Does this top management person accept these responsibilities? _____

4. How are these responsibilities and top management's commitment to fulfilling them documented? _____

5. To whom has responsibility for establishing, implementing, maintaining, and improving the EMS and reporting to top management on the performance of the EMS been delegated? _____

6. Does this delegation include responsibility, authority, and accountability for compliance with legal and other requirements? _____

    a. If not, to whom is responsibility for compliance with legal and other requirements delegated? _____

7. Does the Implementation Team adequately represent the relevant levels and functions of the organization? ___

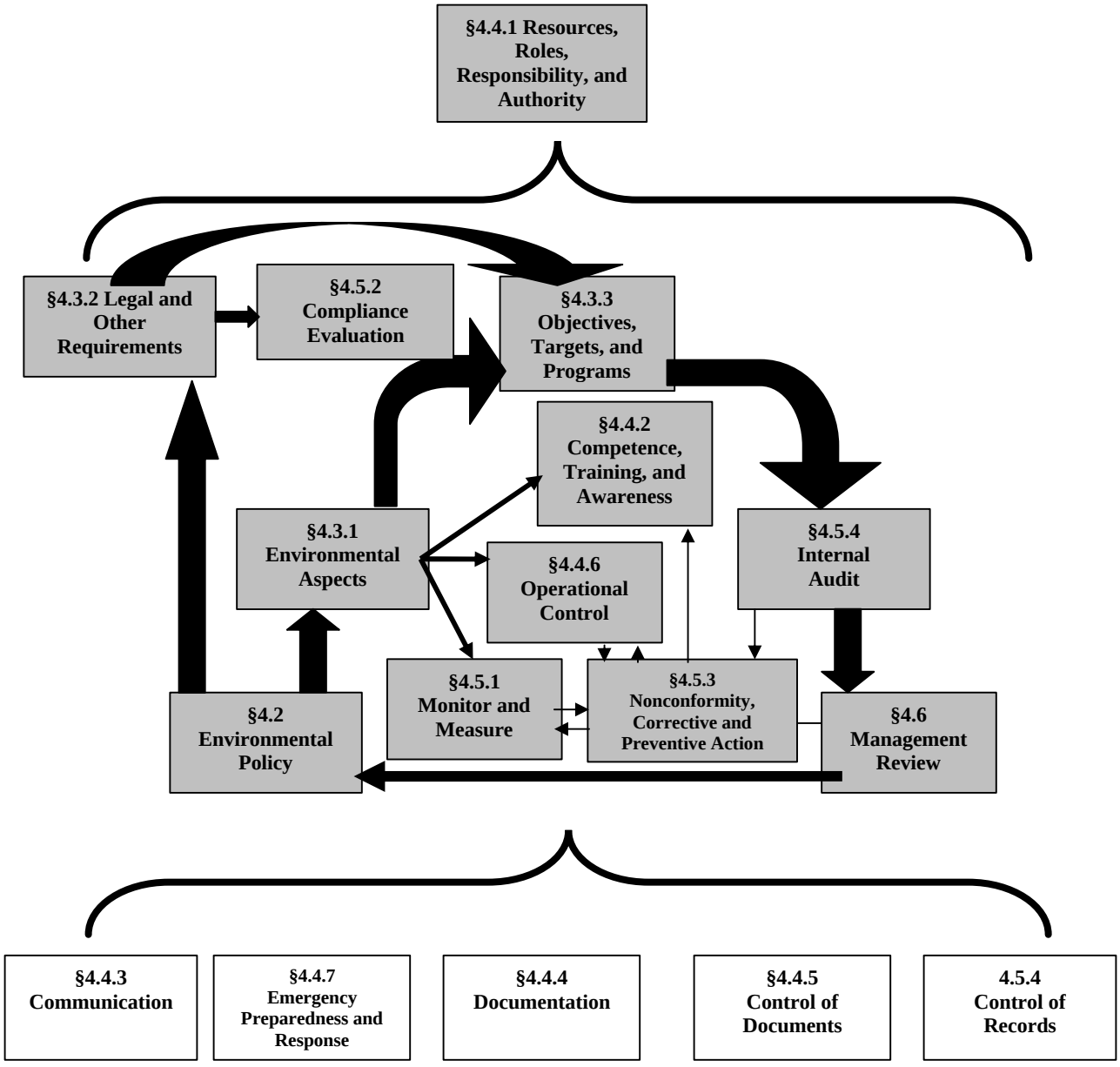
8. Does the Implementation Team have a documented description of its EMS roles and responsibilities and/or a grant of authority? _____

Table of Applicable Legal and Other Requirements

Environmental Aspect	R/NR/Other	Regulation/Other Requirement	How Applied	Compliance Status	Responsible Person

VI. Communication, Emergency Preparedness, Documentation, Control of Documents, and Control of Records under ISO 14001

The five remaining elements of ISO 14001 are presented last because they are the elements most likely to already exist in some form within the organization. Modification of these existing procedures is usually all that is required to have them conform to the requirements of ISO 14001.



1. Communication (ISO 14001:2004, §4.4.3)

The "communication" requirement of ISO 14001 calls for the establishment, implementation, and maintenance by the organization of procedures to:

1. Communicate *internally* among the various levels and functions of the organization about the environmental aspects and the EMS;

2. Receive, document, and respond to relevant communication from *external* interested parties; and

3. *Consider* whether to communicate externally about the organization's significant environmental aspects and document its decision.

Internal Communications – The requirement to communicate "among the various levels and functions" recalls the ISO 14001 requirements to 1) establish objectives and targets at "relevant functions and levels," and 2) designate responsibility for achieving objectives and targets at "relevant functions and levels." When the organization identifies its relevant functions and levels for the purpose of establishing environmental objectives and targets, the same functions and levels apply for designating responsibility for achieving the objectives and targets and for internal communication.

Under ISO 14001, the organization is *required* to communicate the Environmental Policy (§4.2) to all persons working for it or on its behalf and the roles, responsibilities, and authorities for environmental management (§4.4.1).

EMS elements that should be communicated internally include:

- The environmental objectives and targets;
- The impact on overall performance of attempting to achieve the environmental objectives and targets;
- Relevant operational controls; and
- Employee roles in emergency and accident response procedures.

The organization may also want to include other topics as part of the internal communications effort, including:

- The results of environmental monitoring and measurement;
- Information on what other organizations are doing to comply with ISO 14001; and
- Lessons learned in meeting EMS objectives and targets.

Internal communication on the organization's EMS helps to demonstrate management's commitment and increase employee support for the EMS. Communication can also help in understanding of EMS roles, responsibilities, and expectations and in identifying potential system improvements.

External Communications – There are two requirements for external communication within ISO 14001. The most significant requirement for external communication is contained in §4.1, Environmental Policy, which states that top management shall ensure that the policy be "*available* to the public" (emphasis added). The other requirement for external communication is

the requirement in §4.4.6(c) to communicate to suppliers and contractors procedures and requirements related to the significant environmental aspects of their goods and services.

§4.4.3 calls for establishment of *procedures* for receiving and responding to relevant communication from external interested parties (see definition, §3.11) and for deciding *whether* to communicate externally on its significant environmental aspects. If the organization decides to communicate (see last sentence of §4.4.3), then it must establish and implement methods for this communication. The wording of this requirement of ISO 14001 makes non-communication on the significant environmental aspects the default position.

There are no requirements in ISO 14001 for disclosure of information about the organization's environmental performance. Public acceptance of ISO 14001, however, depends upon broad appreciation by the organization for the importance of communication beyond that required by ISO 14001. Forthright, voluntary communication of environmental information to external interested parties – *e.g.*, community groups, regulators, NGOs, lenders, and insurers – establishes an image of social responsibility important to maintaining organizational goodwill.

Public disclosure of environmental performance information is also a key concern of environmental regulators in the U.S. Many regulators would like to see ISO 14001 include a requirement for some form of public reporting.

Communications Worksheet

This worksheet is intended to guide the organization in making its decisions about how to communicate internally about the EMS.

Internal Communications

List the current, *formal* internal communications media that could be used to communicate about the EMS:

_____
_____
_____

List the current, *informal* internal communications media that could be used to communicate about the EMS:

_____
_____
_____

Which of these media will be used to communicate internally about the EMS?

Being sure to name persons responsible, subject matter for communication, and timeframes, develop a specific, written plan for internal communication on the environmental aspects and the EMS for the current EMS implementation cycle:

_____
_____
_____
_____

External Communications

Does the organization have a formal external Communications Policy or procedure that covers environmental communications? _____

Who is responsible for receiving, documenting, and responding to communications from external interested parties? _____

Will the organization communicate externally about its significant environmental aspects? _____

Does (or will) the organization have a program for outreach about its EMS and its environmental aspects to external interested parties? _____

2. Emergency Preparedness and Response (ISO 14001:2004, §4.4.7)

Under the Emergency Preparedness and Response requirement of ISO 14001:2004 (§4.4.7), the organization is required to establish procedures for identifying the potential for and responding to emergency situations and accidents that can have an impact on the environment.

Identification of Potential Emergency and Accident Situations – Experience indicates that organizations infrequently have a preexisting procedure for identifying potential emergency and accident situations. The norm is to establish emergency and accident responses for a variety of emergency and accident situations irrespective of the potential for their occurrence. But ISO 14001 is specific about requiring a procedure *to identify the potential* for emergency situations and accidents. Adhering to the requirement of the procedure is a valuable exercise that helps organizations identify weaknesses in their own emergency planning and to plan for that which is most likely to occur.

Example: Identifying Potential Environmental Impacts of Emergency situations or Accidents

An example of considering the environmental impacts associated with an emergency situation is hypothetically found in the emergency management of the harbor in Valdez, Alaska. The probability of a ship running aground in a harbor like Valdez is estimable based on the number of passages per year and the global number of accidents per 1,000 harbor passages modified for the particular circumstances of Valdez Harbor. For example, if the worldwide incidence of harbor groundings is 1/4000 passages and Valdez is particularly treacherous, it might be reasonably estimated that Valdez will have an occurrence every 1/2500 passages. If there are 250 passages per year in and out of Valdez Harbor, the probability of an accident is one every ten years or .1 in one year. Emergency response plans and available emergency equipment should reflect this reality.

In separately considering potential for environmental impacts, planners would also consider the number of passages in and out of the harbor involving full oil tankers and the environmental consequences associated with a tanker accident. This kind of additional, specific environmental consideration is what is intended by §4.4.7's requirement to identify potential emergency and accident situations that can impact the environment and to determine how to respond.

Because many environmental impacts of an emergency or accident situation are secondary in nature, it appears that *all* potential emergency or accident situations need to be identified before a determination of environmental impacts can be made. An organization that attempts to identify potential emergency or accident situations based on a review of its environmental aspects would likely miss the environmental impact potential of, say, an automobile accident.

There are five steps implied by the emergency preparedness and response requirement:

1) Identify the potential for emergency situations and accidents of all kinds;

2) Paying particular attention to the potential environmental impacts of accidents and emergency situations, identify how the organization can prevent and mitigate associated adverse environmental impacts;

3) Determine how the organization and its employees should respond to emergency situations and accidents;

4) Periodically simulate emergency situations to test response capabilities; and,

5) Review and revise procedures based on experience derived from actual and simulated emergency situations and accidents.

Accident and Emergency Situation Identification – In order to identify potential for and responding to emergency situations and accidents, the organization should develop a procedure for systematically identifying accident and emergency situations, evaluating their probability of occurrence, their likely consequences, and their severity.

Organizations often engage risk management specialists to assist in the identification of potential emergency or accident situations that could lead to human injury, environmental damage, or economic loss. While many checklists are available to facilitate this kind of evaluation, there is virtually no substitute for physical evaluation of facilities by knowledgeable personnel, whether employees or outside professionals.

Emergency Response Procedures – The organization is required to develop procedures for responding to emergency situations and accidents when they occur. Typically, response procedures include identifying public emergency response agencies and their capabilities, identifying individuals within the organization who are trained and able to provide assistance in emergencies, establishing an emergency communications network, and providing emergency lighting, signage, and equipment. Because Emergency Response Procedures are based on identified potential emergency situations and accidents specific to the organization, the emergency response plan will be unique for each organization.

Periodic Testing – The value of conducting emergency response exercises lies not only with simulating situations that could occur but also in identifying flaws in the response plan. Practice drills can be the most effective test of the system to give employees, emergency response personnel, and management the opportunity to walk through the plan and gain familiarity with its procedures. While a full-dress response exercise is valuable, testing of procedures can be effectively done on much smaller scales and still provide the benefits of testing. Above all, the organization should not let the impracticality of a full-dress exercise keep it from testing sub-elements of the emergency response plan.

Review and Revise – ISO 14001 calls for continual improvement of the EMS. Periodically reviewing and revising emergency response plans based on the experience gained from the occurrence of emergency situations or accidents or in testing response plans is an example of continual improvement.

Written Response Plans – Many written emergency response plans are too cumbersome to be of value in an emergency situation – their value depends entirely upon previous training of persons who will be called upon to execute them. Yet, many organizations fail to provide the emergency response training necessary to make the plans functional.

Keeping in mind that even the simplest, most direct emergency response plan requires training for effective implementation, an alternative for organizations to consider is establishment of abbreviated, readily available Immediate Response Directions established for each kind of potential emergency situation or accident. Such an emergency response plan might consist of a laminated card prepared for each potential emergency situation or accident and providing

specific responsibilities and associated actions for employees and visitors, supervisors, emergency coordinators, and emergency directors. Following is an example developed by a manufacturing organization for an emergency occasioned by a fire or explosion:

Immediate Response Directions – Fire/Explosion:

Responsibility	Action
Employees and Visitors	1. Sound fire alarm if readily accessible. 2. Notify a supervisor, or the Emergency Director, Jane Jones, ext. 123; or the Deputy Emergency Director, John Smith, ext. 124. 3. Discontinue work. 4. Shut down all equipment. 5. Secure all sensitive documents. 6. Evacuate to a safe distance from the fire/explosion. 7. Wait for instructions from an Emergency Coordinator or Emergency Director. 8. If instructed to evacuate the building, leave the building and go to the designated assembly area. 9. At the assemble area, check in with the Emergency Coordinator and await further instructions. **Do not attempt to extinguish a fire unless directed to do so by a supervisor or Emergency Coordinator.**
Supervisors	1. Sound the fire alarm if readily accessible. 2. Notify the Emergency Director, Jane Jones, ext. 123; or the Deputy Emergency Director, John Smith, ext. 124. 3. Direct personnel in the affected area to discontinue work, shut down equipment, and secure all sensitive documents. 4. If advisable and if consistent with ABC Company training, use a fire extinguisher to fight a fire in its initial stages. **Never use more than one fire extinguisher or try to fight a fire for more than 30 seconds.** 5. If instructed to evacuate, leave the building and go to your designated assembly area. 6. At the assembly area, check in with the Emergency Coordinator and await further instructions.
Emergency Coordinators	1. If receiving first notice of the emergency situation or accident, initiate the emergency alert tree. 2. Don your Emergency Coordinator vest and go to the site of the fire or explosion. 3. The first Emergency Coordinator on the scene will take charge, directing other Emergency Coordinators to take responsibility for necessary tasks. 4. Emergency Response Tasks of the first responder: • Determine if evacuation is necessary and direct that evacuation begin if it is. **Only an Emergency Coordinator, an Emergency Director, a Senior Manager onsite, or a Fire Department official should give the direction to evacuate.** • Determine if the emergency requires the assistance of police, fire, or rescue agencies. • Direct that emergency calls be made as necessary. 1. Fire Department: 333-245-7500 2. Emergency Medical: 333-245-8000

	3. Police: 333-245-8500 • Direct other Emergency Coordinators to supervise the orderly evacuation of the facility. • Direct one Emergency Coordinator to go to the reception desk to pickup the visitors log and, then, proceed to the assembly area. • Direct one Emergency Coordinator to pickup the emergency response bag (containing a walkie-talkie preset to Channel 8, a list of current employees, and a flashlight), go to the assembly area, and begin to account for employees and visitors. This Emergency Coordinator shall call the role of employees and visitors from the visitor's sign-in sheet to ensure that everyone is accounted for. • Direct one Emergency Coordinator to go to the reception area to direct emergency responders to the emergency site. 5. All Emergency Coordinators shall remain at their duty stations until the emergency has come to rest and the all clear signal has been given. 6. When the Emergency Director or Deputy Emergency Director arrives on the scene, defer to that person as the Emergency Commander.
Emergency Director, Deputy Emergency Director	1. If receiving first notice of the emergency or accident situation, initiate the emergency alert tree. 2. Don your Emergency Director's vest. 3. Go to the site of the emergency and assess the situation from available information. 4. If fire or explosion is within the facility's capability to manage, deploy personnel and equipment necessary to bring the situation under control. 5. If the fire or explosion requires the expertise of one or more members of the in-house Emergency Management Group, direct that those individuals come to the site. • Communications/Public Relations: Joan James, ext. 678 Bob White, ext. 937 • Safety/Medical/Fire: Martha Mead, ext. 965 Fred Firechief, ext. 111 • Radiation Safety: Marie Curie, ext. 379 Ed Teller, ext. 543 • Hazardous Materials/Spill Release Coordinator: Jennifer Kelly, ext. 317 • Personnel Manager: Harry Munster, ext. 318 • Security Officer: Carl Curtis, ext. 620 Clan Destine, ext. 910 • Emergency Director's Assistant: Marie Mariposa, ext. 263 • Facility Manager: Jerry Goodrench, ext. 274 Joan Joiner, ext. 916

	6. If the fire or explosion is beyond the facility's capability to manage, direct that calls be made to appropriate police, fire, and rescue agencies: 1. Fire Department: 333-245-7500 2. Emergency Medical: 333-245-8000 3. Police: 333-245-8500 7. Determine if facility is at greater risk of loss if building power and utilities remain operating; direct shutdowns as appropriate. 8. As necessary, deploy Emergency Coordinators to: • Supervise the orderly evacuation of the facility. • Go to the reception desk to pickup the visitor's log and, then, proceed to the assembly area. • Pickup the emergency response bag (containing a walkie-talkie preset to Channel 8, a list of current employees, and a flashlight), go to the assembly area, and begin to account for employees and visitors. This Emergency Coordinator shall call the role of employees and visitors from the visitor's sign-in sheet to ensure that everyone is accounted for. • Go to the reception area to direct emergency responders to the emergency site. 9. Consider the environmental consequences of the event and direct that such preventive actions as are possible and appropriate be taken. 10. Stay at the scene of the fire or explosion until the immediate emergency has come to rest and is being effectively managed.

Emergency Preparedness and Response Worksheet

This worksheet is intended to guide the organization in making its decisions about its Emergency Response Procedures.

Potential Accident and Emergency Situations

List the potential accident and emergency situations likely to occur within your organization, their probability of occurrence in a one-year time period, and your best estimate of economic damages from the occurrence; last, multiply Column 2 by Column 3 and enter the result in Column 4:

1. Potential Accident or Emergency Event	2. Likelihood of Occurrence in One Year	3. Best Estimate of Economic Damages	4. 2 x 3 = Relative Value of Accident or Emergency Event in One Year
Fire or Explosion			
Work Injury – slip, fall, strain, cut			
Work Injury – fall from elevation			
Work Injury – automobile accident			
Work Injury – violence			
Hurricane or Tornado			
Earthquake			
Blizzard			
Power Loss			
Illness – heart attack			
Illness – diabetic reaction			
Spill or Release of Hazardous Materials			
Bomb Threat			

Rank of Potential Accident or Emergency Situations

Using the values established in the foregoing table and your independent judgment, determine which potential accident or emergency situations are most significant.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

Associated Environmental Impacts

For each potential accident or emergency situation identified in the preceding list, use the following table to identify any associated environmental impacts, determine what can be done to prevent the occurrence of the environmental impacts, and/or what can be done to mitigate the environmental impacts:

Ranked Potential Accident or Emergency Situation	Associated Environmental Impacts	Preventive Actions	Mitigative Actions
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Review and Revision of the Emergency Response Procedures

Review and revise the Emergency Response Procedures to give appropriate attention to potential accident or emergency situations.

4. Documentation (ISO 14001:2004, §4.4.4)

Several requirements of ISO 14001 cover the need to document the EMS and the importance of ensuring that everyone in the organization is working with up-to-date information. EMS documentation should, first and foremost, provide a useful picture of the EMS and guide individuals to relevant information.

EMS Documentation

The purpose of documentation of the elements of ISO 14001 is threefold:

1) To document procedures whose application must be consistently implemented;
2) To document those elements of the EMS, including records, that provide objective evidence that ISO 14001's requirements are being executed and maintained; and
3) To meet specific legal, customer, or other requirements for documentation.

Elements specifically required by ISO 14001 to be documented (including elements requiring that records be kept) include:

- The Environmental Policy;

- The scope of the EMS;
- Environmental Aspects and Significant Aspects;
- Objectives and Targets;
- Roles, Responsibilities, and Authorities;
- Records of competence of persons performing tasks that have the potential to cause a significant environmental impact;
- Records of having identified and taken action on training needs associated with the environmental aspects and the EMS;
- The decision on whether to communicate externally about the significant environmental aspects;
- Description of the main elements of the EMS;
- Documents required to ensure the effective planning, operation, and control of processes that relate to the significant environmental aspects;
- Operational Procedures where their absence could lead to deviations from the Environmental Policy or the established Objectives and Targets;
- Procedures to monitor and measure key characteristics of operations and activities that can have a significant impact on the environment;
- Records of regulatory compliance evaluations;
- Necessary changes to procedures as the result of corrective and preventive actions; and
- Management Reviews.

Distinguishing ISO 9001 Documentation Requirements

Although expressed differently in their respective Requirements, the documentation requirements of ISO 9001 and ISO 14001 are much the same. Each requires documentation of:

- Policy and objectives;
- Procedures required by the standard;
- Documents needed to ensure effective planning, operation, and control of processes; and
- Records.

ISO 9001 requires establishment of a Quality Manual that includes:

- Description of the scope of the management system;
- The documented procedures or reference to them; and
- Description of the interaction between the management system procedures.

ISO 14001, which does not specifically require a manual, includes these requirements for a manual in the requirements for documentation.

In spite of these nominal differences, the practice of organizations adopting ISO 9001 typically is to establish elaborate management system manuals having separate sections for each main element of the standard with uniform subsections covering scope and purpose, requirements,

procedures, responsibilities, related documentation, and review. This level of documentation is often redundant, internally contradictory, and ignored because of its complexity.

Description *vs*. Direction
The essential ISO 14001 requirement for documentation is that it *describe* the main elements of the EMS and their interaction with references to related documentation. EMS documentation, however, is much more effective if it not only describes the EMS elements but also *directs* that they be established, implemented, and maintained.

An environmental manual that 1) describes the EMS elements and their interaction; 2) directs that they be established, implemented, and maintained; 3) references related documents; and, 4) in appendices, provides detailed work instructions, operating procedures, and records of performance adequately addresses EMS documentation needs in one manual.

When it comes to establishment of documented operational procedures or work instructions to control situations (associated with the identified significant aspects) where the absence of procedures or instructions could lead to deviations from the environmental policy or the objectives and targets (§4.4.6), it is recommended that, even though the procedures or instructions may be embedded in larger sets of operating procedures or work instructions, that the procedures relating to the significant aspects be documented separately and that this documentation be maintained in order to make clear which procedures or instructions are put in place as a consequence of determining that certain operations are associated with the significant aspects.

Appendices – As it relates to this EMS Procedures Manual, an appendix is a section of the manual intended for the maintenance of related information that changes from time-to-time, work instructions, operating requirements, and records. An appendix may be a physical part of the manual or separate so long as it remains identifiable as an appendix to the main document.

EMS Procedures Manual
Following is an example of recommended content sections of an EMS Procedures Manual:

> **§1. Definitions –** Frequently used ISO 14001 definitions and definitions that are specific to the organization
>
> **§2. Scope –** Scope of the EMS implementation as defined by the organization
>
> **§3 Environmental Policy**
>
> **§4 Resources, Roles, Responsibilities, and Authorities –** Roles, responsibilities, and authorities as determined by the organization
>
> **§5 Legal Requirements Procedure**
>
> **§6 Aspects, Objectives, Targets, Plans and Programs Procedures**

§7 Competence, Training, and Awareness Procedures

§8 Communication Procedures

§9 Operational Control Procedures

§10 Monitoring and Measurement Procedures

§11 Emergency Preparedness and Response Procedure

§12 Nonconformity, Corrective and Preventive action Procedures

§13 Documentation, Document Control, and Records Procedures

§14 Compliance Evaluation Procedure

§15 EMS Audit Program Procedures

§16 Management Review Procedure

Appendix A – EMS Roles (names of incumbents), Implementation Team Charter, Green Team Charter

Appendix B – Summary of applicable environmental regulations and other requirements

Appendix C – Relevant functions and levels, environmental aspects, significant aspects, objectives and targets, plans and programs to achieve the objectives and targets

Appendix D – Training needs assessment, significant aspects competence evaluation, EMS awareness plans, organization/people who work on behalf of the organization

Appendix E – Internal communication plans, record of communications from/to external interested parties

Appendix F – Operational controls over significant aspect operations, procedures and requirements for suppliers and contractors

Appendix G – Monitoring and measurement activities

Appendix H – Inventory of potential emergency and accident situations

Appendix I – Results of nonconformity investigations and actions

Appendix J – Documentation, document control, and records work instructions

Appendix K – Results of regulatory compliance evaluations

Appendix L – Results of EMS audits

Appendix M – Reports of Management Reviews

5. Control of Documents (ISO 14001:2004, §4.4.5)

Document Control (§4.4.5) is a stand-alone requirement of ISO 14001 in the sense that every organization should have a document control procedure covering all important documents, not just those relating to environmental management. §4.4.5 describes the elements of such a procedure.

Document control under ISO 14001 refers to a system for documenting procedures requiring documentation by the EMS standard, ensuring that those procedures are available to the people who need to execute them, and that there is an orderly and functioning system for reviewing, revising, and replacing obsolete documents.

6. Control of Records (ISO 14001:2004, §4.5.4)

While *documentation* describes procedures and systems and what the organization intends to do, *records* are documents that memorialize actual performance. For example, the organization *documents* its environmental objectives and targets and *records* (in a document) the results of its efforts to achieve the objectives and targets. In addition to establishing an historical record of environmental performance, records provide EMS auditors with objective evidence that the EMS procedures have been established and implemented and are being maintained.

The "records" requirement of ISO 14001, §4.5.4, requires organizations to establish and maintain a system for keeping and, at appropriate times, disposing of environmental records. Part of the reason for maintaining records is to demonstrate conformance to ISO 14001. The standard is specific as to requiring that records on training, audits, and management reviews be maintained. It is up to the organization to decide what additional records to keep, how to keep them, and for how long. Procedures for identification, maintenance and disposition of records should focus on those records needed for the implementation and operation of the environmental management system and to record the extent to which planned objectives and targets have been met.

It is not necessary to retain everything — only records that add value and demonstrate an accurate and complete picture of EMS conformance need to be maintained. Environmental records may include:

- Regulatory compliance records;
- Training records;
- Process information;
- Product information;
- Inspection, maintenance, and calibration records;
- Pertinent contractor and supplier information;
- Incident reports;
- Information on emergency preparedness and response;
- Audit results; and

- Management Reviews.

In addition to satisfying a requirement of ISO 14001, documentation and record keeping serve multiple interests of the organization:

- Environmental regulatory compliance personnel should be able to use the EMS records as a reference guide on facility compliance history and future compliance needs;

- EMS documentation can assist in establishing effective environmental training and awareness, environmental communication, and record keeping programs as part of monitoring and measurement; and

- The EMS documentation system can ensure proper routing of questions to the correct information sources.

Documentation, Document Control, and Record Keeping Worksheet

This worksheet is intended to assist organizations in determining how best to document the EMS, control the documents generated by the EMS, and what records to keep and for how long.

Documentation

Has the organization established and implemented and is it maintaining a written manual or electronic document that contains:

1. The Environmental Policy? Y ___ N___

2. The environmental objectives and targets? Y ___ N___

3. A description of the scope of the EMS? Y ___ N___

4. A description of the main elements of the EMS and their interaction with references to related documents? Y ___ N___

5. Documents and records required by ISO 14001? Y ___ N___

6. Documents and records necessary to the planning, operation, and control of processes that relate to the significant environmental aspects? Y ___ N___

Document Control

1. Describe the procedure for control of EMS documents:
   _____
   _____

2. Who has authority to approve documents prior to use?
   _____
   _____

3. What is the procedure for reviewing, updating, and re-approving EMS documents?
   _____
   _____

4. What is the procedure for ensuring that changes and the current revision status of documents are identified?
   _____
   _____

5. What is the procedure for ensuring that relevant versions of applicable documents are available at points of use?
   _____
   _____

6. What is the procedure for ensuring that documents remain legible and readily identifiable?

   _____
   _____

7. What is the procedure for ensuring that external documents such as customer drawings are identified and their distribution controlled?

   _____
   _____

8. What is the procedure for preventing unintended use of obsolete documents?

   _____
   _____

9. What is the procedure for identifying documents if they are to be retained for any purpose?

   _____
   _____

Control of Records

The following table is intended to assist the organization in determining which records it should maintain so that it can demonstrate conformance to the requirements of its own EMS and to ISO 14001.

Record	Retained Y/N?	Where Retained	By Whom	Disposal Date
Environmental Policy				
Environmental Aspects				
Significant Aspects				
Applicable Legal Requirements				
Applicable Other Requirements				
Objectives and Targets				
Programs to Achieve Objectives and Targets				
Roles, Responsibilities, and Authorities				
Competence				
Training Needs Assessments Records				
Internal Communications				
External Communications				
EMS Procedures Manual				

Original and Revised Documents				
Operational Controls				
Communication of Procedures and Requirements to Suppliers and Contractors				
Emergency Response Procedures				
Monitoring and Measurement Records				
Equipment Calibration Records				
Legal Compliance Evaluations				
Other Compliance Evaluations				
Records of Nonconformities, Corrective and Preventive Actions				
Internal Audit Reports				
Management Reviews				

VII. ISO 14001 Auditing and Registration

ISO 14001 Registration

A registration system has grown up around the implementation of the ISO 9000 quality management documents and has formed the basis for a similar system of registration to ISO 14001. At this writing, ISO 14001 is the only "specification" document of the ISO 14000 series and the only standard that is intended to be auditable; all of the other standards are, or will be, "guidance" documents.

Registrars – Globally, there are 40 – 50 or more organizations established to register organizations to ISO 14001. These registration organizations are accredited by the standards bodies in, for the most part, major industrial nations that have adopted ISO 14001 as their country's EMS standard. In the U.S., for example, the body that accredits registrars is the ANSI-ASQ National Accreditation Board (ANAB). ANAB passes on the credentials of registrars to register organizations to ISO 14001.

ISO 14001 Audits

First-, second-, or third-party auditors can assess an organization's conformity to the requirements of the standard.

First-party Audits – In the first-party circumstance, the internal auditors of the implementing organization conduct an audit to determine that the EMS has been properly implemented and is being maintained. If the organization passes the internal audit, it may "self declare" its conformity to ISO 14001.

Second-party Audits – In the second-party circumstance, the audit is conducted by a representative of a party interested in the environmental performance of the implementing organization. The "interested party" may be a customer, an environmental regulator, an insurance company, or any other organization affected by the environmental performance of the implementing organization. The second-party audit can be a condition of doing business with the auditor's organization.

Third-party Audits – In the third-party circumstance, an external EMS auditor conducts an audit, usually at the request of the implementing organization, to determine if the organization conforms to the requirements of ISO 14001. The third-party audit is most often for the purpose of "certifying" that the organization is in conformity with the requirements of ISO 14001. Typically, when a registration is awarded, it is for a period of three years with a provision for the periodic conduct of "surveillance" audits to ensure continuing conformity.

A principal benefit of the third-party audit is that it compels organizations to continually maintain the EMS in order to pass the follow-up surveillance audits; without this, there might be slippage in the maintenance of ISO 14001.

It is not a requirement of implementing ISO 14001 that organizations have a registration audit conducted; this is a decision made by each organization based upon its determination of the commercial value or necessity of certifying. When an ISO 14001 EMS is intended to be audited,

the requirements must be implemented and documented sufficiently for an auditor/registrar to be able to conduct the audit based on the finding of *objective evidence* that the organization has implemented an EMS conforming to ISO 14001.

Establishing objective evidence requires a higher level of documentation and record keeping than is required for mere implementation of ISO 14001. The implementation of ISO 14001 is a simpler task for the organization when it is only seeking to implement the policy and sixteen procedures than when it is implementing with the intention or expectation of being audited.

VIII. The Future of ISO 14001

ISO 14001 has the potential to reframe the conduct of environmental management. It has proven to be an elegant document that anticipates the needs of organizations of all sizes and purposes for direction on environmental management.

As ISO 14001 gains credibility as an effective system for managing and improving environmental performance, environmental regulators will be encouraged to accept registration to ISO 14001 in satisfaction of some regulatory administrative requirements and, thus, reduce the burden of compliance for those organizations that are managing their environmental exposures. Indeed, in June 2000, U.S. EPA established a Performance Track program that outlines circumstances under which U.S. EPA will endorse special allowances for organizations adopting an EMS while maintaining a good compliance record. Several states have taken similar actions.

Ultimately, the greatest strides in environmental performance improvement and sustainability will come as a consequence of millions of organizations – municipalities, colleges and universities, governmental departments, and property owners and operators as well as industrial corporations – identifying and managing the environmental impacts of their activities, services, and products.